Congress of the United States
Washington, DC 20515

July 17, 2008

The Honorable Mary Peters
Secretary
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Peters:

We write to express our support for the Pennsylvania High-Speed Maglev Project. Thank you in advance for your consideration of our views.

Project proponents have worked hard to position the Pennsylvania Project as the most technologically advanced and environmentally friendly high-speed maglev project in the United States. After originally submitting its draft of the Final Environmental Impact Statement (FEIS) to the Federal Railroad Administration (FRA) in March 2007, we understand that the Pennsylvania Project is now within weeks of completing a seven-year, $17 million process mandated by the National Environmental Protection Act (NEPA). Following completion of the FEIS, some additional work will be necessary to obtain a Record of Decision (ROD). It is estimated that this work can be completed within approximately two years. With completion of the ROD and available funding, we are advised that the first 19-mile segment from the Pittsburgh International Airport to downtown Pittsburgh can be built in approximately two and one-half years. This initial 19-mile segment has the potential to demonstrate for the entire country the applicability of the maglev technology to varied and rugged terrain over a wide temperature range and other climatic conditions, and the crossing of a major river. This project should also demonstrate the application of this technology in urban, suburban and rural environments. Additionally, we are advised that the project will serve an existing transportation need and be a self-sustaining, revenue producing project upon completion.

Over the last eighteen years, MAGLEV, Inc., the private partner in this project's public-private partnership, has developed new and sophisticated manufacturing systems and has fabricated the only steel high-speed maglev guiderails manufactured outside of Germany. In a joint development program, these guiderails were fabricated under a contract with the Office of Naval Research for precision fabrication technology as part of its stealth ship program. Most significantly, MAGLEV, Inc. has developed a computer-integrated robotic welding precision fabrication technology that will significantly drive down the cost of fabricating high-speed maglev guiderails. The technology can also be used in all large-scale steel fabricating applications, including other transportation modes – highway bridge construction, shipbuilding and possibly railroad bridge construction. In recent weeks, we are informed that MAGLEV, Inc. representatives met with FHWA structural engineers to discuss application of the fabricating advancements to the manufacturing of tub girders for highway use in the U.S., with potential fabricating cost savings of as much as twenty percent.

On January 11, 2006, Pennsylvania Secretary of Transportation Al Biehler submitted an application to the U.S. Department of Transportation for the $45 million provided in SAETEA-LU for a maglev project east of the Mississippi River. Although no criteria had been established in the legislation for applying for the funds, the Pennsylvania Project submitted an application based on the project's environmental process (EIS) and extensive knowledge and technological innovations developed over the years, including the advanced precision fabricating technology. Included in that application were fourteen tasks necessary for the final development and preparation for deployment of the project. With minor modification, those tasks remain as the intended use for the $45 million.

During these developments, it is our understanding that FRA's awareness of the Pennsylvania Project's advancements resulted in FRA contracting with MAGLEV, Inc. to conduct evaluations for the agency in the areas of noise levels, ground vibration and EMF levels of the Transrapid Maglev System operating in Lathen, Germany. The Transrapid System is the maglev technology being utilized by all projects in the United States.

We are advised that the Pennsylvania High-Speed Maglev Project has received strong financial support from both the Commonwealth of Pennsylvania and private sources totaling more than $15 million. Since the passage of SAFETEA-LU, the Commonwealth of Pennsylvania has already appropriated nearly $4 million in matching funds toward the $45 million federal grant. It is our understanding that additional state funds are now being considered in the current budget process. Additionally, in recent years several Capital Budget authorizations totaling more than $500 million have been passed by the Pennsylvania General Assembly and signed into law by the sitting governors. As a demonstration of diversity, the project has also contracted for precision welding work to sustain operations and development when other funding was unavailable. We are not aware of any other project which can claim more non-federal financial support than the Pennsylvania Project.

With its multiple levels of development and soon to be completed FEIS, we believe that the Pennsylvania High-Speed Maglev Project has the greatest capability of achieving near-term deployment in the United States. Our nation's current national energy crisis and growing transportation needs demand that we move expeditiously to deploy and demonstrate the operation of alternative transportation systems, including high-speed maglev in the United States. Directing all of the $45 million designated for a single project east of the Mississippi River, as originally provided in SAFETEA-LU, is the best way to expedite deployment of a maglev system in the United States. A scattered approach to distribution of the funds will only serve to dilute concentration on project development and delay actual deployment in the United States.

With contract authority for high-speed maglev now provided by the enactment of P.L. 110-244, the SAFETEA-LU Technical Corrections Act of 2008, we urge you to move quickly to distribute the $45 million designated for existing projects east of the Mississippi River. The imminent completion of the FEIS by the Pennsylvania Project mandates that further related activities be conducted expeditiously and within a reasonably acceptable period of time. Otherwise, certain aspects of the FEIS may need to be updated for timeliness of the studied material. As such, a delay in proceeding at this point would represent a significant waste of previously spent funds, both federal and state. Such costly rework would only serve to be a setback in both time and limited financial resources and the result would be a discouragement for all maglev projects in the United States. We submit that the Pennsylvania High-Speed Maglev Project is best suited to utilize the funds to the greatest extent of any eligible project and encourage you to award the $45 million of maglev funds designated for east of the Mississippi River to the Pennsylvania Project.

Finally, we encourage you to visit the Pennsylvania Project's MAGLEV, Inc. facilities in McKeesport, Pennsylvania at your convenience to witness first-hand the extensive operations and development of the most advanced high-speed maglev project in the United States.

Thank you for your attention to this matter.

Sincerely,

Senator Arlen Specter

Senator Bob Casey

Rep. Tim Murphy

Rep. John Murtha

Rep. Phil English

Rep. Mike Doyle

Rep. Bill Shuster

Rep. Jason Altmire

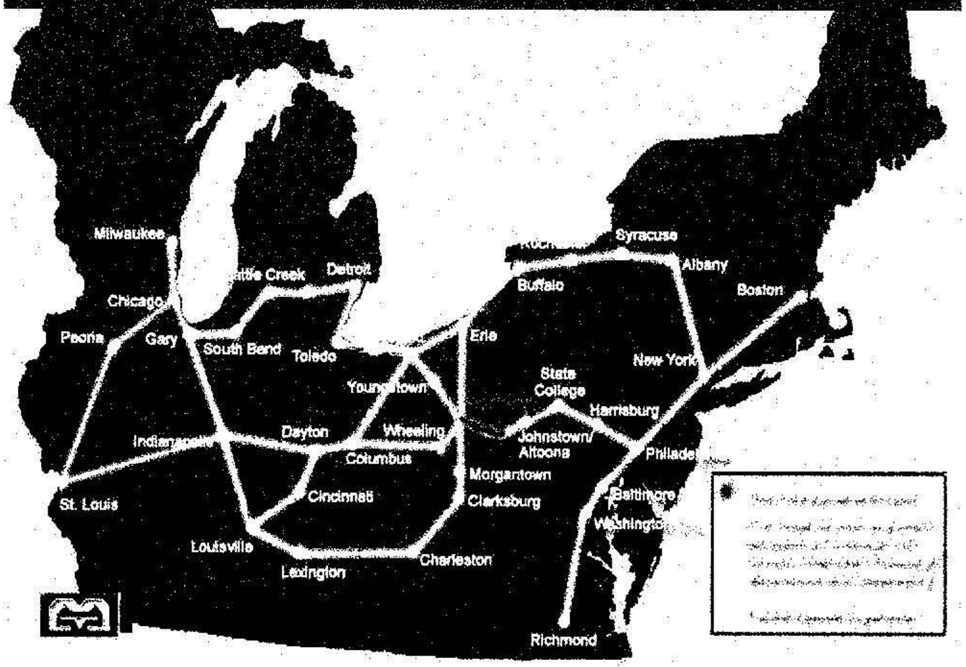
Rep. John Peterson

Rep. Robert Brady

Rep. Jim Gerlach	Rep. Allyson Schwartz
Rep. Joe Pitts	Rep. Tim Holden
Rep. Charlie Dent	Rep. Patrick Murphy
Rep. Todd Platts	Rep. Joe Sestak
Rep. Christopher Carney	Rep. Paul Kanjorski

Rep. Chaka Fattah

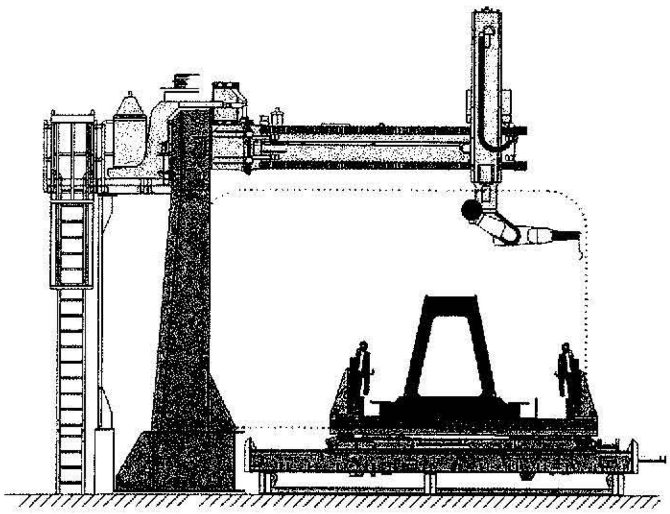
Central Location of SW Pennsylvania for High-Speed Maglev



Region Included in 500-mile Radius from Pittsburgh

#2

Fully Automated Side-Beam Gantry Dual Robot Welding System



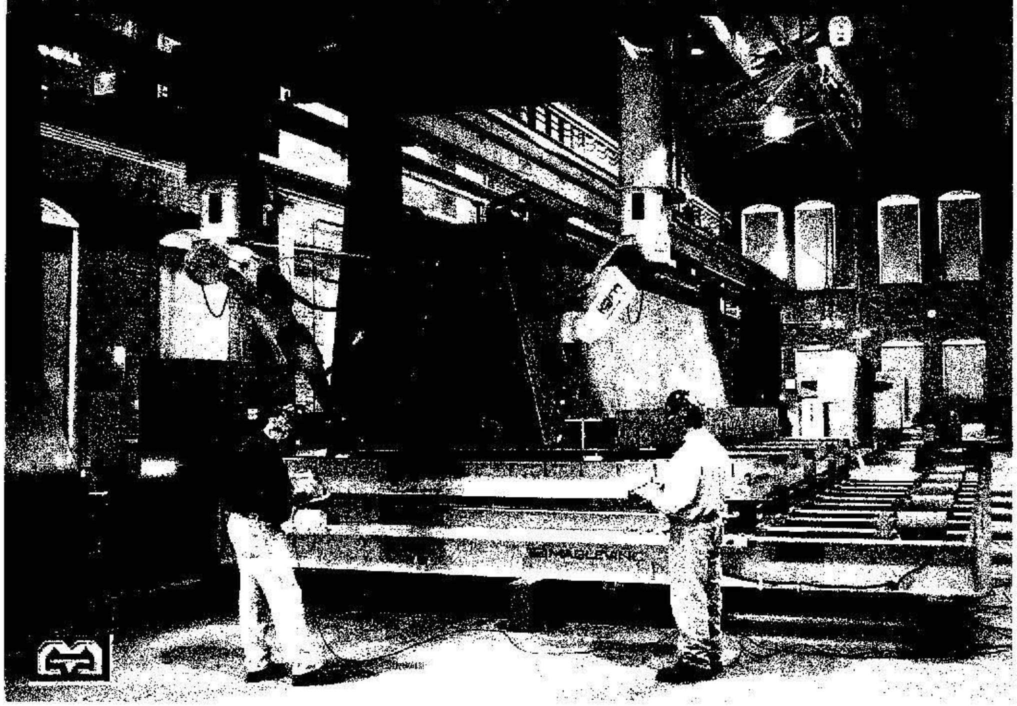
Two Dimensional Section of Gantry Welding System

Gantry Capability
- Dual Robot System
- 35 Meter Longitudinal Travel
- 3 Meter Cross Slide
- 1.5 Meter Vertical Slide

Robot Capability
- 6 Axis Movement
- Off Line Programmed
- Synchronous Welding

Table Capability
- Computer Controlled
- Rapid Reconfiguration
- 3.2 Meter Table Surface
- 1.0 Meter Vertical Lift
- 1.2 Meter Horizontal Curve
- 1.0 Meter Vertical Curve
- 25 Degree Twist

Robot Synchronization with a Gantry System and Automated Fit Up Table



#3

US005823114A

United States Patent [19]

Cioletti et al.

[11] **Patent Number: 5,823,114**

[45] **Date of Patent: Oct. 20, 1998**

[54] **UTILITY DISTRIBUTION SYSTEM INCORPORATING MAGNETIC LEVITATION VEHICLE GUIDEWAYS**

[75] Inventors: **Joseph Cioletti**, Pittsburgh; **Joseph Koepfinger**, Coraopolis; **Frank Young**, Murrysville, all of Pa.

[73] Assignee: **Maglev, Inc.**, Pittsburgh, Pa.

[21] Appl. No.: **618,057**

[22] Filed: **Mar. 25, 1996**

[51] **Int. Cl.**^{6} **E01B 25/00**

[52] **U.S. Cl.** .... **104/124**; 191/23 R; 191/25

[58] **Field of Search** .... 104/123, 124, 104/125, 126, 118, 281, 282; 191/23 R, 25, 26, 27; 52/220.1, 220.2, 220.3, 220.5, 220.7; 404/71

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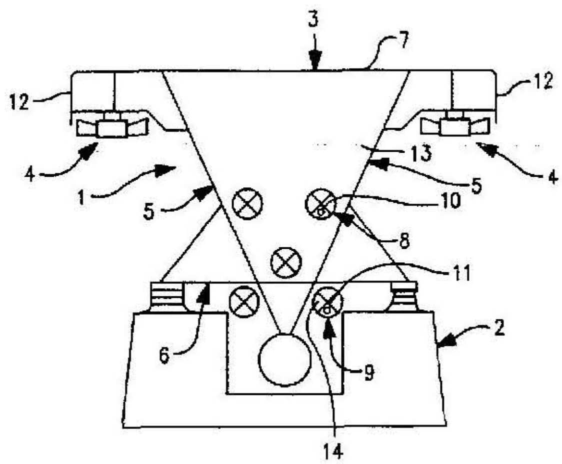
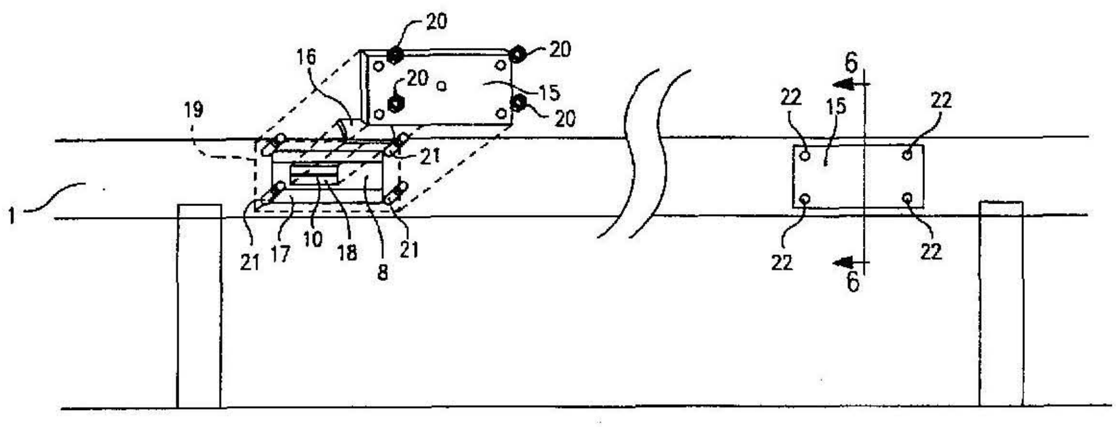
Primary Examiner—Mark Tuan Le
Attorney, Agent, or Firm—Reed Smith Shaw & McClay

[57] **ABSTRACT**

A utility transmission and distribution system includes a guideway for a magnetic levitation transportation system, and supports for supporting the guideway above the ground. The guideway includes a base connected to a structure defining an enclosed channel. At least one conduit defining an enclosed space is disposed within the channel, and is rigidly connected to the channel such that movement over the guideway remains unimpeded. At least one cable is disposed within the conduit for transmitting and distributing utilities.

4 Claims, 4 Drawing Sheets





#4

UTILITY DISTRIBUTION SYSTEM INCORPORATING MAGNETIC LEVITATION VEHICLE GUIDEWAYS

BACKGROUND OF THE INVENTION

The present invention relates generally to utility transmission and distribution systems, and more particularly to a system to effect such distribution and transmission in conjunction with guideways for magnetic levitation vehicles and transportation systems.

Electrical wires and cables are typically suspended above the ground via a series of large, metallic towers. Such high tension wires and supporting towers are unsightly, susceptible to weather conditions, difficult and dangerous to maintain, and may be dangerous to humans due to the electromagnetic pulse that emanates from the wires. Many communities and landowners resist the installation of such towers and are apprehensive of the potential harmful effects associated with the wires and the diminished value of the land over which the high tension wires travel.

Burying the wires and cables in the ground reduces the wires' and cables' exposure to the weather and eliminates the need for unsightly towers. However, buried cables and wires are difficult to access in that they have to be uncovered by excavating the ground under which they lie. Conversely, buried wires and cables are susceptible to being damaged and severed by indiscriminate excavations by other utility services and construction workers. Additionally, land and easements must be acquired for the buried wires and cables.

In an age of increasing competitiveness in the fields of telecommunications, computer networks, and electrical power distribution; increasing public and landowner opposition to unsightly towers and potentially harmful high tension wires; and increased difficulty and costs involved in obtaining rights-of-ways and easements for utility transmission, an alternative to high tension wires and towers and buried cables is needed. In particular, in an increasingly national and global market where utility companies, including electric suppliers, wish to supply services to people and companies outside of their local geographic area, a means to convey energy, signals, and communications cross-country without having to install high tension wires and buried cables across long distances is desired.

SUMMARY OF THE INVENTION

According to a first aspect of the present invention, a utility distribution system includes a guideway for use in a magnetic levitation transportation system, and supports for supporting the guideway above the ground. The guideway includes a base rigidly fixed to a structure defining an enclosed channel, at least one conduit disposed within the enclosed channel of the guideway, and a utility transmission device disposed within the conduit.

According to a second aspect of the present invention, a utility distribution system includes a guideway for use in a magnetic levitation transportation system, and supports for supporting the guideway base above the ground. The guideway includes a base rigidly fixed to a structure defining an enclosed channel, at least one conduit disposed outside the enclosed channel and a utility transmission device disposed within the conduit.

It is, therefore, an object of the present invention to provide an alternative to high tension wires and buried cables for the cross-country transmission of electrical power, signals, and communications. Installing wires and cables for

the transmission and distribution of electricity, signals, and communications along and/or inside of guideways for magnetic levitation vehicles provides an opportunity to protect the wires and cables from extreme weather conditions and errant excavations without having to go through the costly process of procuring land and easements and erecting towers or excavating ditches because the land for the guideways will already have been acquired. Additionally, the mutual benefits and opportunities of a magnetic transportation system coupled with an utility transmission distribution system will draw more public and private investment, financing, and assistance to construction of such cross-country systems and will draw less public opposition.

It is another object of the present invention to reduce maintenance costs and problems by allowing easier access to the utility transmission wires and cables while concurrently protected such cables and wires from exposure to the elements and inadvertent damage from errant excavations.

It is yet another object of the present invention to provide cheaper and more ready access to utilities for rural consumers along the guideway path than is currently provided by local utility companies. The ability of low cost utilities to transmit and distribute utilities outside of their geographic regions will lead to increased competition among utility suppliers and hence lower utility prices for utility consumers in general.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a cross-sectional view taken along line **2**—**2** of FIG. **2** showing multiple potential locations for utility transmission devices;

FIG. **2** is an elevational view of a magnetic levitation guideway and supports for attaching the guideway above the ground showing multiple potential locations for utility transmission devices;

FIG. **3** is an enlarged view of the conduit and utility distribution device shown in FIG. **1**;

FIG. **4** is an exploded view of the components of the magnetic levitation guideway;

FIG. **5** is an elevational view of an access panel in the guideway and conduit shown in FIGS. **1**–**4**; and

FIG. **6** is a cross-sectional view taken at the midpoint of the access panel in the guideway shown unconnected to the guideway in FIG. **5** showing the access panels in the guideway and conduit.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

The utility distribution system of the present invention consists of a guideway **1**, at least one conduit **8** disposed within the structure of the guideway or one conduit **9** disposed on the outside surface of the guideway, and a utility transmission device **10**, **11** within each conduit, as depicted in FIGS. **1** and **2**.

The guideway **1** in the preferred embodiment is constructed of steel and consists of the following elements, as best depicted in FIG. **4**: a base **3** over which movement takes place, side guide rails **12** connected to either side of the base **3** and flush with the upper surface (the surface facing away from the ground) of the base **3**, profiles **4** rigidly fixed to the bottom surface (the surface facing the ground) of the base **3**, and two transverse flange plates **5** forming an inclined web attached fixedly between the bottom surface of the base **3** and the lower flange plate **6**. The distance between the inner faces of the transverse flange plates **5** decreases from a

BEFORE THE
FEDERAL RAILROAD ADMINISTRATION

DOCKET NO. FRA-2009-0045

CAPITAL ASSISTANCE FOR HIGH SPEED RAIL CORRIDORS AND INTERCITY PASSENGER RAIL SERVICE: PUBLIC INPUT ON RECOVERY ACT GUIDANCE TO APPLICANTS

COMMENTS OF THE
ASSOCIATION OF AMERICAN RAILROADS
June 5, 2009

Executive Summary

Improved intercity passenger rail service offers great promise to our nation in many ways, but the starting point for discussion must be a common understanding of what it requires in new or existing rail infrastructure. At lower speeds, track generally can be shared between freight and passenger lines if the following interests are responsibly and fairly addressed: safety; capacity; compensation; and liability. At higher speeds, tracks should be separated and dedicated, as they are in the overwhelming majority of high speed rail systems around the world.

Introduction

The Association of American Railroads (AAR), submits these comments on behalf of its member freight railroads in response to the Federal Railroad Administration's (FRA) Notice seeking input on the issues that should be addressed in the interim guidance and recommendations on the criteria to be used in evaluating grant applications for capital assistance for high speed rail corridors and intercity passenger rail service. AAR is a national trade association whose members include the nation's major freight railroads;[1] these railroads operate 72 percent of freight industry's line-haul mileage, produce 95 percent of its revenue and employ 92 percent of its employees.

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[1] Amtrak and some commuter railroads also are members of AAR.

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AAR and its member railroads applaud the leadership of President Barack Obama and Secretary Ray LaHood in recognizing the importance of rail to the future of the nation's transportation network. As the recently released *Vision for High Speed Rail in America* (*Vision*) recognizes, railroads confer great public benefits because they are they are the most fuel efficient and environmentally sound mode of transportation. Of particular importance to our nation's future is rail's ability to play a more significant role in reducing both greenhouse gas emissions and traffic congestion. These benefits result from both passenger and freight rail service.

The President's multi-billion dollar initiative provides a unique opportunity to expand intercity passenger rail service in a manner that better meets the needs of both the general public and users of rail services. In his April 2009 High-Speed Rail Strategic Plan, embodied in the *Vision*, the President calls for development of both express and regional high-speed corridors, along with upgrading the functionality and connectivity of current intercity passenger rail service. The strategic transportation goals outlined in the *Vision* – ensuring safe and efficient transportation choices, building a foundation for economic competitiveness, promoting energy efficiency and environmental quality and supporting interconnected, livable communities – can be achieved through greater investments in rail.

The *Vision* also appropriately acknowledges that reshaping the nation's transportation system with expanded rail choices will bring significant challenges. One of the key challenges flows from the fact that in many cases intercity passenger rail will share a right-of-way with freight railroads which serve a broad range of customers whose livelihoods and market competitiveness are tied to timely and efficient rail service. Layering additional or expanded intercity passenger rail service or velocity on the freight network can work in many instances if appropriate accommodations for current freight volume and future growth are made. In any case, advancing higher speed rail without compromising the vital present and future role of the freight rail industry is an issue that must be confronted. These comments are intended to help guide public policy and project guidelines so that the vision of higher speed passenger rail service can be realized.

Current Framework

Intercity passenger rail is provided by the National Railroad Passenger Corporation (Amtrak) which was formed in 1970 as a federally-sponsored corporation. Apart from the Northeast Corridor (Washington DC-New York-Boston) and a few other track segments, Amtrak moves its passengers over a 22,000 mile network of track owned by freight railroads. Pursuant to operating agreements with Amtrak, freight railroads currently provide the majority of the right of way and infrastructure necessary to accommodate more than 315 Amtrak passenger trains per day over 43 routes, carrying an average of 78,500 passengers per day. Indeed, 71 percent of the miles traveled by Amtrak trains are on tracks owned by host railroads.

This movement of rail passengers takes place over the same network that nearly every industrial, wholesale, trade, retail, agricultural and mining-based sector of the economy relies on to move its products. All told, railroads account for 43 percent of intercity freight volumes – more than any other mode of transportation. To build and maintain this infrastructure, since 1980 (when the rail industry was partially deregulated) railroads have reinvested more than $440 billion of their own funds on locomotives, freight cars, tracks, bridges, tunnels, signal systems and other essential technology and infrastructure. As a consequence, the combination of safety, efficiency, capacity and affordability is unmatched by any other freight rail system in the world.

To make higher speed passenger rail work in this country, first and foremost will be maintaining the health of the freight railroad industry which provides the literal foundation for intercity passenger rail mobility. As the *Vision* recognizes, expansion of high speed rail must be accomplished in a way that avoids diversion "from the core operating and maintenance responsibilities" of the freight railroads.

The High Speed Rail Vision

President Obama's *Vision* proposes a long-term strategy intended to build an efficient high speed passenger rail network. Specifically, it envisions four types of intercity passenger rail service:

- **Conventional Rail**: Traditional intercity passenger rail services of more than 100 miles with 1-12 daily frequencies; top speeds of up to 79 mph to as high as 90 mph, generally on shared track.
- **Emerging High Speed Rail:** Corridors of 100-500 miles; top speeds of up to 90-110 mph on primarily shared track, with advanced grade crossing protection or separation.
- **Regional High Speed Rail**: Frequent service between major and moderate population centers 100-500 miles apart, with some intermediate stops. Top speeds of 110-150 mph; grade separated, with some dedicated and some shared track.
- **Express High Speed Rail:** Frequent express service between major population centers 200-600 miles apart with few stops. Top speeds of at least 150 mph on completely grade-separated, dedicated rights-of-way (with possible shared track in terminal areas).

President Obama's near-term investment strategy seeks to:

- Upgrade reliability and service on conventional intercity rail services (operating speeds up to 79-90 mph).

- Develop emerging high speed (90-110 mph) on shared track.
- Develop regional high speed (110-150 mph) on dedicated track.
- Advance new express high speed service (above 150 mph) on primarily dedicated track.

Partnering with Private Railroads to Implement the Vision

Ideally, freight railroads and intercity passenger railroads would operate in completely separate worlds. Separate corridors enable faster, safer, and more reliable passenger service, while eliminating or greatly reducing the operational, capacity, engineering, legal, and other impediments that can hinder the ability of freight railroads to successfully accommodate passenger trains on non-separated corridors. However, for passenger rail operators to acquire their own completely separate right of way would be prohibitively expensive and, for a host of reasons, an unlikely prospect. As a result, higher speed passenger rail will, in many cases, be sharing tracks, or at least rights-of-way with freight railroads. Indeed, the *Vision* contemplates that other than express high speed rail (speeds of at least 150 mph), intercity passenger rail operations will involve at least some shared track. This will necessitate a partnership between the host freight railroad and the high speed rail operator that protects the business needs and responsibilities of both parties.

Today, as the *Vision* notes, high speed rail is "constrained by the capacity of rail lines and by freight traffic." Nonetheless, in several areas, sufficient land exists within and immediately adjacent to the freight rail right of way to accommodate the addition of more freight and passenger tracks. In other areas of the country, the volume of freight traffic may be so great that a separate high speed passenger corridor makes more sense for both parties. Clearly each high speed rail origin-destination pair is unique and governed by its own circumstances. Consequently, generalizations are difficult to make about when, where and how freight rail and high speed passenger rail can share the same right of way or infrastructure successfully over a long term without adversely affecting the interests of either party. As such, each specific project must be treated on a case-by-case basis.

Given this reality, the *Vision* properly recognizes that it is essential that grant applicants have in place, or describe clearly how they will reach, agreements with, among others, the infrastructure owners/host railroads. Agreements that grant access to the privately owned rail network must be negotiated on a voluntary, case-by-case basis and must address site specific safety, operational, compensation and legal issues. The interim guidance to be issued by FRA to grant applicants should instruct that the following principles must be taken into account in their agreements with host railroads.

(1) SAFETY: Agreements must give paramount attention to safety.

- While unique circumstances may allow passenger train speeds in excess of 90 mph on jointly used passenger and freight tracks, the expectation must be that passenger and freight train service will operate over separate tracks, perhaps in a shared right-of-way, when proposed passenger train speeds exceed 90 mph. The operating characteristics and/or volumes and frequencies of both the freight and conventional passenger traffic and freight rail availability of right-of-way on a given corridor would govern this decision.
- Agreements must include strategies for mitigating risks covering, but not limited to: highway grade crossings enhancements including sealed corridors, where necessary; placement and configuration of passenger stations; separation between existing and proposed tracks; train control systems, including positive train control, or other advanced technologies (either required by regulation or designated by host railroads); track and bridge upgrades; incremental track maintenance and component replacements; use of wayside detector devices; and intrusion prevention.

(2) ACCESS and CAPACITY: Access to freight rights-of-way cannot compromise service to present or future freight rail customers. Advancing high speed rail at the expense of freight rail's ability to handle growing freight volumes would be counterproductive public policy, as degradation of current or future freight service would exacerbate highway congestion, reduce fuel efficiencies, reduce U.S. competitiveness and increase greenhouse gas emissions if freight rail were rendered an unattractive transportation alternative to customers.

- Service to railroad freight customers must be protected and cannot be compromised by high speed passenger rail route schedules, curfews, or other restrictions that would affect the quality, capacity or reliability of freight service.
- New infrastructure construction must fully preserve both the ability to operate freight trains as needed and the opportunity to expand future freight service.
- New infrastructure design must fully protect the host railroad's ability to serve existing customers, both freight and passenger, and locate future new freight customers on and adjacent to its lines.

(3) COMPENSATION: Host railroads need to be adequately compensated.

- To the extent high speed passenger rail operations use freight railroad assets and property, they must provide the host railroad with a reasonable return on its investment, including recouping costs associated with participating and providing information and studies necessary to develop any high speed rail project proposal

- Operating high speed passenger rail trains at speeds greater than existing freight or passenger operations will require significantly higher maintenance costs and enhanced track infrastructure. The applicant should be prepared to fully compensate the host railroad for these additional and ongoing costs.

(4) LIABILITY: Host railroads must be protected from increased liability risks associated with high speed passenger rail service.

- Host freight railroads need to be fully protected against any and all liability that would not have resulted but for the added presence of high speed passenger rail service.
- For the freight railroads to take on any liability that arises from passenger rail operation on their lines would amount to an unwarranted subsidy of passenger rail.[2]

Though these can be difficult issues, they cannot be avoided if the high speed rail *Vision* is to be realized along with the equally important goal of moving the nation's growing freight volumes economically and with the least environmental impact. The freight railroads are committed to working with FRA and all high speed rail stakeholders to make the future of intercity passenger rail a win-win situation.

Respectfully submitted,

Louis P. Warchot
Daniel Saphire
Association of American Railroads
50 F Street, NW
Washington, D.C. 20001

Counsel for the Association of American Railroads

June 5, 2009

[2] See *GAO Report to Congressional Requesters on Commuter Rail*, GAO-09-282, p. 7 (Feb 2009). "[B]ecause Amtrak is prohibited from cross-subsidizing commuter rail agencies and freight railroads on the Northeast Corridor (NEC), Amtrak cannot assume additional liability for these parties in its agreements for shared use of infrastructure."

REVIEW CRITERIA ANALYZED UNDER THE GUIDELINES PRESCRIBED FOR TRACK 2 FUNDING FOR THE
PENNSYLVANIA HIGH-SPEED MAGLEV PROJECT

(Note: FRA guideline criteria in *bold italics*)

§5.1.1 PUBLIC RETURN ON INVESTMENT

1. (PRIORITY #1) Transportation Benefits §5.1.1.1 – Factors to be considered in assigning a rating will include the contribution the project would make to:

(A) Supporting development of intercity high-speed rail service;

The project will initiate true high-speed rail service in the United States using the Transrapid International (TRI) high-speed maglev technology at speeds exceeding 250 MPH on the 54-mile long project. As the system expands beyond the initial 54-miles, cruising speed will increase to 310 MPH, which exceeds the speed of some current short-distance airline commuter flights. It will bring extraordinary service to principal communities across Pennsylvania and to communities in other states in the network. It will offer each separate community the equivalent of commuter flights to multiple locations while simultaneously delivering longer-range (up to 500 miles) intercity service that surpasses the point-to-point travel capability of any other mode of transportation.

The project has national significance. The topography and climate variations of the Pittsburgh region will verify high-speed maglev's adaptability to all regions of the U.S. The initial deployment will Americanize and certify the Transrapid technology for adaptation and public use throughout the entire United States.

The project will form the hub of a multi-state, high-speed intercity rail system. The project is located at the center of a 500-mile radius that encompasses one-half the population of the United States. It is within travel distances within the 500-600 mile range that the Federal Railroad Administration (FRA) refers to as the "sweet spot", or optimum range, for applying high-speed rail technology.

An immediate benefit from construction of the project would be to alleviate any unfounded criticism of the technology, including construction costs, performance, operating costs, etc. It will demonstrate the capabilities and potential for long-term, true high-speed rail throughout the U.S. and without the need for annual subsidies.

Although the project is designed as the initial core deployment of a multi-state high- speed, intercity network, it will serve an immediate, defined need in the reduction of travel times, mitigation of traffic congestion and improvement of air quality.

#6

Construction of the first segment will demonstrate the system's capability of accessing a fully developed urban setting at a high rate of speed and with negligible impact on the existing infrastructure. Its elevated guideway will allow it to enter into the heart of the City of Pittsburgh with minimum impact on existing structures. In fact, the total number of impacts on both commercial structures and households for the entire project is remarkably low, being less than four residential structures per mile. This equates to six individual residential units (households) per mile, driven up to this level by the impact on several buildings in an apartment complex. Additionally, less than one commercial structure per mile will be affected. Proving its adaptability in this situation will support development of high-speed maglev in other high-density population areas where other technologies would have a far greater physical impact on the existing infrastructure and at a considerably higher cost than maglev,

(B) Generating improvements reflected by increases in ridership, increased on-time performance, reduced trip times, additional service frequency and other factors;

Ridership projections as detailed in the Draft Environmental Impact Statement (DEIS) are based on two investment grade ridership studies, including a Federal Railroad Administration appointed peer review panel of national experts.

The high-speed maglev train will deliver and pick up passengers in the heart of downtown Pittsburgh, a major metropolitan center that is restricted in its transportation options and ~~being bound by~~ its three major rivers, surrounding hills and saturated urban development. Downtown Pittsburgh and the other outlying stations will be served at 10-minute intervals from 6:00 AM until 12:00 AM on weekdays and from 7:00 AM until 1:00 AM on weekends. Shorter service intervals (headways) provide riders with the utmost flexibility and can vary from 8½ to 12 minutes during peak hours and 10 to 15 minutes during off-peak hours.

The Transrapid technology began commercial operation in Shanghai, China in April 2004. Since then, the system has moved over 18 million passengers over 3.3 million miles at 15 minute intervals with an on-time performance of over 99.8 percent within one minute of schedule. The Pennsylvania Project offers the same technology and the same performance. The transit time from the regional station at the airport to downtown Pittsburgh is eight minutes.

The travel time during peak travel periods and the frequent unexpected delays for the 19-mile segment from the airport to downtown will be reduced by 30 minutes or more over highway transportation. The total trip time will be 10.5 minutes, including stopping at a regional station to serve non-airport traffic as mandated by the Department of Homeland Security under its policy of discouraging non-airport travelers from using airport facilities.

Travel time for the 17-mile segment from the Monroeville/Penn Hills station to downtown Pittsburgh will be reduced to 11 minutes and the 30-mile trip from Monroeville/Penn Hills to the airport will be 21.5 minutes. The full trip savings will be approximately one hour and fifteen minutes or more during peak rush hours and other commonly experienced and increasingly unpredictable congested periods. The savings would be twenty-five minutes during non-congested or off-peak travel times.

Transportation efficiencies will also be realized by reducing travel time into Pittsburgh from both the east and the west by 40 minutes or more during peak travel periods and during routine periodic and unpredictable back-ups in highway traffic.

Expansion of the system beyond the Pittsburgh urban area will produce even greater reductions in travel times. High-end operating speeds over longer distances between stations will produce vastly shorter trip times for longer distances. For example, service from Pittsburgh International Airport to Harrisburg, with stops in six cities (downtown Pittsburgh, Monroeville/Penn Hills, Greensburg, Johnstown, State College, and Altoona) will take just one hour and forty-five minutes. This is nearly a four-hour reduction from the current service, which does not even operate far enough north to provide service to State College. While providing service to six intermediate stations, the maglev system will still average approximately 150 MPH from start to finish. By comparison, the French TGV from Paris to Lyons only serves two intermediate cities (Le Creusot and Mâcon-Loché) and operates at an average speed of approximately 130 MPH.

Of equal significance, the TGV operates primarily over flat terrain while the maglev operation will traverse rugged terrain over a large portion of the route. Between the Pittsburgh Airport and the downtown station, it will travel along the lower slope of Mt. Washington as it approaches the city of Pittsburgh, and between Altoona and Harrisburg it will travel through the Allegheny Mountain Range. Even in this difficult terrain, the maglev system will not require an annual subsidy for operations and maintenance due to its unique operating characteristics as described in greater detail in Section 5 (C) on page 14 below.

Westbound service from downtown Pittsburgh to downtown Cleveland with four intermediate stops (Pittsburgh Airport, Youngstown/Sharon area, Akron area and Cleveland Airport) is preliminarily projected to take less than one hour (45-50 minutes) from center city to center city.

(C) Generating cross-modal benefits including favorable impacts on air or highway congestion, capacity or safety and cost avoidance or deferral of planned investments in aviation and highway systems;

The 54-mile project, particularly in the first two segments, will reduce the ever-increasing highway congestion on the Parkway West and Parkway East and provide a frequent, safe and reliable travel alternative throughout the most extreme weather conditions of rain, snow and ice. This will offset the need to build additional lanes of highway in a corridor that is constrained by development adjacent to the existing highway. Additionally, the Parkway East and Parkway West are each channeled through two-lane tunnels that are approximately one-mile long. Both tunnels are already the cause of frequent and unpredictable delays. Any highway lane expansion will necessitate the boring of additional tunnels to maintain traffic flow to accommodate the additional lanes. The Fort Pitt Tunnel at the end of the Parkway West empties onto the Fort Pitt Bridge at the convergence of the rivers at the Point of Pittsburgh. Constructing additional tunnels will also necessitate construction of an additional bridge to span the river but with further complications relating to establishing new traffic patterns in an already saturated dense urban center as the new bridge reaches the downtown Pittsburgh side of the river.

As the system expands eastward to Greensburg and beyond to Johnstown, Altoona and State College, current infrequent and unreliable short commuter connecting flights to Pittsburgh International Airport can be replaced by fast, frequent and dependable high-speed rail service and improving utilization of the Pittsburgh International Airport.

The planned project will provide a financially self-sustaining east-west transportation artery through the City of Pittsburgh that will reduce congestion and lower existing transportation costs. It will deliver the equivalent of a ten-lane highway through downtown Pittsburgh while having only a very slight impact on the existing infrastructure.

(D) Creating an integrated network with allowance for and support of future network expansion;

The project is specifically designed as the initial core element of a multi-state network. The operations and maintenance center will be constructed to easily accommodate further additions necessary to integrate expansion of the system, including its operations, control and maintenance requirements.

With high-speed maglev having a segregated right-of-way, the question related to allowances for and support of future expansion in freight owned rights-of-way is of no concern.

The trainsets will initially be comprised of three cars, each capable of comfortably carrying one hundred passengers. They are expandable to ten cars and a total trainset capacity of 1,000 passengers. Thus, expanding the capacity of the system without the expense of adding additional guideway is an economically minor matter by expanding the size of the trainsets and without affecting any of the systems operating characteristics or its performance. Minimal expansion costs such as this will help facilitate further extension of the system to other cities.

Section 5 (C) on page 14 below, details the lack of need for operating subsidies, creating a funding source for further expansion of the network. This is achieved through the reduced maintenance requirements of the maglev system brought about, in part, by the fact that it is a contact-free transportation system.

(E) Encouragement of intermodal integration through provision of direct, efficient transfers among intercity transportation and local transit networks at train stations, including connections at airports, bus terminals, subway stations, ferry ports and other modes of transportation;

Upon exiting the maglev train at the airport, the system will provide immediate and direct access to the airport ticket counter area via escalators and elevators. In Pittsburgh, it will provide full, direct intermodal access either within the maglev terminal or via enclosed moving walkways to connect with the Pittsburgh Amtrak Station, intercity and local buses, private autos and taxis and the local light rail system at the downtown Steel Plaza Station. The downtown station design facilitates ease of flow and connectivity with bus service to and from Oakland. Other maglev stations will be equally integrated with all existing and anticipated modes of transportation at each location.

(F) Equitable financial participation in the project's financing, including donated property;

Property owned by the Pittsburgh Airport Authority will be provided to the project to facilitate operations over the initial four miles. Approximately 9.5 miles of right of way owned by the Allegheny Valley Railroad have been pledged to facilitate operations over the second segment from downtown Pittsburgh to Monroeville/Penn Hills.

The project can also serve as an alternative to currently stalled efforts to construct electric transmission towers and power lines from generating stations in western Pennsylvania near the Pittsburgh Airport eastward to Harrisburg and the east coast. The project developers hold patents to encapsulate electric transmission lines and communications cables within the protection of the maglev guideway structure. With a right-of-way established through the acceptance of the Final Environmental Impact Statement, only minor, independent modification to the environmental statement will be required to include the transmission lines. This will provide an additional source of revenue for the project that was not included in the original financial plan.

(G) The overall safety of the transportation system;

The vehicle's wraparound design with the guideway precludes the possibility of derailments. Except when entering and departing stations, the entire system is elevated by at least sixteen feet.

The system's integral design for propulsion by electromagnetic force prohibits energizing the guideway in opposing directions to cause a head-on collision. Vehicle motion is in the direction of a traveling electromagnetic wave. Unlike typical electric catenary systems, which are constantly energized, only the portion of maglev guideway over which the vehicle is operating is energized and advanced electronic control features prohibit energizing adjoining portions of the guideway. The traveling wave also prohibits rear-end collisions. The entire operation of the system is governed by an integrated computer system with redundancy of control. Any actions of the onboard operator are secondary to the primary control by the computer system. It is the equivalent of an advanced Positive Train Control (PTC) system.

The elimination of sharing track and/or corridors with freight railroads erases the possibility of encountering freight train derailments or other operational exposures. Liability related to this specific matter has been an ongoing issue with the owners of the freight systems regarding usage of the track by passenger trains. See "Executive Summary" in Section 5 (G) on page 16 below.

2. (PRIORITY #5) – Economic Recovery Benefits §5.1.1.2 – Each application will be assessed based on its demonstration of the proposed project's anticipated positive economic and employment impacts and potential to promote economic recovery in a cost-effective manner, consistent with the purposes and principles of ARRA. Factors to be considered in assigning a rating will include the contribution the proposed project would make to:

(A) Rapidly promoting new or expanding business opportunities including the short and long term creation and preservation of jobs, during construction and thereafter;

In a 2½-year construction schedule, the first 19-mile segment will utilize:
132,000 tons of domestic plate steel
47,670 tons of steel rebar
16,400 tons of electrical steel
500 miles of ¾" diameter aluminum cable
237,000 cubic yards of concrete

The entire 54-mile long project will utilize:
330,000 tons of domestic plate steel
143,000 tons of steel rebar
41,000 tons of electrical steel
1,250 miles of ¾" diameter aluminum cable
712,000 cubic yards of concrete

The project will create approximately 2,500 direct construction jobs and, once in operation, will create and maintain 214 permanent jobs in operations, maintenance and stations. Additionally, related and spinoff jobs will be significant. Based on acceptable industry standards for calculating total job creation in the transportation industry, the $1.9 billion initial segment from the Pittsburgh Airport to downtown Pittsburgh will create nearly 57,000 jobs and the $1.7 billion segment from downtown Pittsburgh to Monroeville/Penn Hills will create approximately 51,000 additional jobs.

There will be further significant job creation from economic development at the stations and in continued expansion of the system both east and west.

(B) Increasing efficiency by promoting technological advances;

The precision fabricating technology will enable rapid production of the steel guideway by introducing a computer integrated automatic fit-up table and a robotic welding system that will replace the current industry fabricating standard that still requires extensive manual adjustment in the set-up stage. The fully computer integrated, automated fit-up table will reduce to minutes what presently takes days to set up on a fit-up table to hold the metal in position at the degree of precision required for robotic welding of maglev guiderails. These systems have been developed by MAGLEV, Inc.

Operation of the Transrapid International (http://www.transrapid.de) high-speed maglev system is controlled by advanced electronic systems that enable operation at under non-contact technology virtually eliminates wear and the precision fabricated guideway is designed to maintain its alignment without routine adjustment. The system's operations and maintenance costs are less than one-half those of traditional high-speed steel-wheel-on-rail systems resulting in the elimination of annual operating subsidies from the state or federal government.

The train system's unique accelerating and decelerating capability is four times faster than the most advanced steel-wheel-on-rail systems and its grade climbing ability is more than three times greater than steel-wheel-on-rail systems. These capabilities result in high-speed maglev quickly reaching maximum operating speeds and maintaining them until nearly reaching the next station and they enable the system to absorb station stops into the operation with far less impact on the operating schedule than steel-wheel operations. The technology's grade climbing ability permits the maglev system to navigate difficult terrain with ease, an important characteristic in constructing high-speed rail in Pennsylvania and in other challenging locations.

The train's operating capabilities makes it possible for travel over the initial 19-mile segment from the Pittsburgh Airport to center city Pittsburgh to reach a peak speed of 250 MPH and to maintain an overall average speed of 106 MPH from station stop to station stop. By comparison, because of its much slower acceleration capacity, a steel-wheel-on-rail system would not even be able to reach this speed before having to initiate braking procedures to make the stop at the downtown Pittsburgh station.

Once under operation, the maglev system will promote Pittsburgh's economy and add quick and easy accessibility to downtown Pittsburgh regardless of the travel demand at any time of day.

(C) Providing long-term economic benefits;

Installation of the system will promote regional economic growth due to ease of access of employees to work sites, providing the worker mobility desired by newly locating businesses.

The manufacturing and fabricating methodologies developed to build the guideway will be adaptable to other manufacturing end users to improve quality, increase production and reduce product time-to-market. It will promote increased manufacturing opportunities within the U.S. and reverse the trend of losing manufacturing capacity to foreign countries.

The precision fabricating technology developed to manufacture the steel guideway will also be used to initiate other steel manufacturing applications. It will be used to improve the quality and reduce the cost of fabricating steel highway bridge components (both I-beam and tub girder) by as much as 20 percent The technology can also be applied to shipbuilding and other large-scale structures and can bring back into the U.S. some of the jobs previously lost to offshore manufacturers. See additional related information under the following §5.1.2 Project Success Factors – Project Management Approach at paragraph at §5.1.2.1, paragraph (D).

The construction of the project would also result in tourist appeal to many throughout the country. Although this has not been credited as a major income and/or ridership source, it would have some further impact in this regard and help promote use of the Convention Center and other tourist activities. The tourist experience at the German test facility in the remote Emsland area produced significant ridership from thousands of tourists worldwide, resulting in a waiting list to ride the train. From 1989 – 2006, over 500,000 visitors travelled nearly 700,000 miles on the closed-loop circuit.

(D) Avoiding reductions in State-provided essential services;

With a $3 billion shortfall in the current state budget, many essential services are targets for reduction. The employment levels created by this project, including the long-term jobs, would result in substantial economic returns to the state in the form of wage taxes, sales taxes from purchases by people with renewed spending capacity and other new business opportunities. The creation of the tens of thousands of jobs produced by the project will provide revenue to the state to maintain many of the essential services that are in jeopardy.

An important additional benefit to be derived from the construction of the project is the availability of the innovative fabricating technology to produce bridge components that would result in major savings to the state, both in the short-term and in the long-term. Pennsylvania has more deficient bridges than any other state in the U.S. A projected 20 percent reduction in the cost of fabricating bridge components would have a major impact on Pennsylvania's bridge repair program. Savings of this magnitude, particularly over an extended period of time, will enable the state to redirect resources to other essential services. Naturally, the introduction of this technology will enable other states to obtain the same benefit.

3. (PRIORITY #2) – Other Public Benefits §5.1.1.3 – Each application will be assessed based on its demonstration of the potential to achieve other public benefits in a cost-effective manner. Factors to be considered in assigning a rating will the contribution the project will make toward:

(A) Environmental quality and energy efficiency and reduction in foreign oil, including the use of renewable energy sources, energy savings from traffic diversions from other modes, employment of green building and manufacturing methods, reduction in key emissions types, and the purchase and use of environmentally sensitive, fuel-efficient, and cost-effective passenger rail equipment;

In May 2009, the American Lung Association reported that Pittsburgh was the most polluted city in the U.S. by short-term pollution and it ranked second by year-round particle pollution. The project will have a significant, positive impact on air quality in the Pittsburgh metropolitan area. The diversion of traffic from the major arteries cutting through the city via I-376 (Parkway East) and the Parkway West will have a major impact on reducing auto emissions based on ridership projections developed for the EIS. The favorable cost comparison between the maglev fare and the per-mile auto costs, the measurably reduced and dependable travel times, high frequency of service and avoidance of downtown parking charges are key factors in diverting highway traffic to high-speed maglev.

The maglev system is powered by electricity, which can be produced by many sources of fuel, including solar, gas, coal, nuclear, wind, hydroelectric, etc. The energy consumption is the lowest per passenger mile of any public ground transportation mode in existence.

Transrapid consumes less energy than steel-wheel trains when operating at the same speed or, if compared on the basis of using the same amount of energy, the performance of the Transrapid system is higher than steel-wheel operations. The key reasons for maglev's superior performance are: (1) no losses due to friction with the non-contact technology; (2) the high efficiency of the long-stator linear motor; (3) the low weight of the vehicles; and (4) the low aerodynamic design of the vehicles. Compared to highway and air traffic, Transrapid's energy consumption is three to five times less.

The synchronous long stator linear motor of the Transrapid maglev system is used both for propulsion and braking. When the direction of the traveling field is reversed, the motor becomes a generator, which brakes the vehicle without any contact. The braking energy can be re-used and fed back into the electrical network.

Substantial energy efficiency will result from the fabrication technology that nearly eliminates rework, which is common in the fabricating world today. Foe example, in the shipbuilding industry, between 35-40 percent of all the components require rework to make them fit properly. The cost of this rework can be as much as 50 percent of the original fabrication costs. Assuming a parallel relationship between energy and total fabrication costs, the resultant savings should be between 17.5 percent and 20 percent of the total energy costs. A more detailed description of the fabricating technology is provided in Section 4 (D) on page 11 below.

All stations and buildings, including the operations and maintenance facilities, will be constructed as "green buildings".

(B) Promoting livable communities, including integration with existing high- density, livable development (e.g., central business districts with public transportation, etc.);

Downtown Pittsburgh has experienced a renewal in private residency in recent years. Direct access from downtown to the Pittsburgh Airport, complete integration with other modes of transportation and the plan to expand the project to a multi-state, high- speed network is a critical element in furthering the development of downtown Pittsburgh as a model livable community. In connecting downtown Pittsburgh with other regional cities, high-speed maglev facilitates mobility of the workforce, thus increasing the efficiency of the workforce and promoting desirability of the area for those wishing to relocate or expand. All stations are designed for ease in integrating all available intermodal traffic.

The Pittsburgh International Airport owns the second largest landmass of any airport in the U.S. The nearby commuter station at Enlow Road will promote growth due to its fast and frequent access to downtown, combined with airport accessibility. The stations at Pittsburgh, Monroeville/Penn Hills and Greensburg will provide each community with fast, reliable and convenient access to the Pittsburgh International Airport and also provide outlying communities with the same type of service into downtown Pittsburgh, the region's social and economic hub.

§5.1.2 PROJECT SUCCESS FACTORS

4. (PRIORITY #3) – Project Management Approach §5.1.2.1 Applications will be evaluated against two criteria to assess the likelihood of successful implementation and realization of benefits. Evaluation will take into account the thoroughness and quality of the supporting documentation for the project management plan, financial plan and SDP:

(A) The applicant's financial, legal and technical capacity to implement the project, including whether the application requires any waivers of FRA safety regulations that have not been obtained;

The Commonwealth of Pennsylvania, applicant for the project, has sufficient financial and legal capacity to carry out implementation. Technical capacity regarding the high-speed maglev project is supplied by MAGLEV, Inc., private partner in the project, and Transrapid International, developer of the technology. Jointly, the public-private partnership is fully capable of implementing the project. MAGLEV, Inc. has pioneered innovative fabricating technology to reduce the construction costs and expedite the production of the high precision fabricated steel guideway, which has a life cycle of 80+ years.

High-speed maglev is a fully tested, operationally proven and commercially operated technology. However, the FRA has not yet set any safety standards or promulgated any regulations in the U.S. regarding the high-speed maglev technology. Preliminary work has been done and system and guideway certification will begin with the next available funding. In the earliest phase of construction of the initial segment of the project, test operation will enable safety certification while the remainder of the project continues under construction. Some aspects of the system may be able to receive certification based on the operation of the ninth generation of the vehicle technology that was certified for commercial operation in May 2009 by the German government.

(B) The applicant's experience in administering similar grants and projects;

The applicant, Commonwealth of Pennsylvania, has extensive experience in program administration over a long period of time. Historically, it created the Pennsylvania Turnpike, the nations' first superhighway and is capable of creating America's first high-speed rail network. Each year it administers and processes federal grants into the many hundreds of millions of dollars for projects and programs of all nature and size. The Commonwealth's $60+ billion annual budget is one of the largest in the nation.

(C) The soundness and thoroughness of the cost methodologies and assumptions, and estimates for the proposed project;

Since no high-speed maglev project has been implemented in the U.S., a consulting group retained by the public sponsors conducted an independent cost/risk assessment study in 2004. Based on MAGLEV, Inc.'s target construction schedule for the entire 54-mile project (including limited contingencies and using conventional construction techniques), the cost study results were within 10 percent of the presented project cost. However, MAGLEV, Inc. has developed new and innovative construction techniques for installing the steel guideway and which are designed to further reduce construction costs and compress the construction schedule.

Two investment grade ridership studies, with a Federal Railroad Administration appointed peer review panel of national experts, form the basis of the ridership calculations. While the fare structure has not been finalized, and further revenue optimization will be studied, a fare structure of $5.00 between each station with 7.5-minute peak frequency of service intervals was used in the DEIS to provide an estimate of fare-based revenues.

(D) The adequacy of any completed engineering work to assess and manage/mitigate the proposed project's engineering and constructability risks;

Originally, producing guideway to the close dimensional tolerances required for high-speed maglev was considered an engineering and constructability risk. However, the fabricating technology has been developed by MAGLEV, Inc. to reduce costs and expedite guideway fabrication. This developed technology has been used successfully in the fabrication of components for the Office of Naval Research's current stealth ship program.

The methodology integral to the fabricating innovations was identified by the FHWA in 2001 when it conducted a scanning tour of Europe and Asia to conduct a broad overview of newly developed manufacturing techniques that are in use abroad for steel bridge fabrication and erection, as there is a recognized need to modernize structural steel fabrication facilities in the U.S. The focus of the trip was on the role that steel production, design, innovation and fabrication have in modern steel fabrication facilities in Japan, Italy, Germany and the United Kingdom. The subsequent implications developed by FHWA for changes in U.S. practices included two principal components that are already incorporated into MAGLEV, Inc.'s fabricating technology: (1) the elimination of submerged-arc welding (and required flux handling systems) in favor of automation-friendly GMAW or MIG/MAG welding processes, and; (2) use (and long-term archival) of a single 3D CAD model as the sole source of information on detailing, shop drawing information, CNC drilling and cutting instruction, automated inspection and virtual assembly (geometry verification). MAGLEV, Inc. has utilized these techniques in developing its fabricating technology.

Senior representatives from HDR Engineering, a global engineering company and a participant in the FHWA scanning tour, recognized the further innovation by MAGLEV, INC. In July 2007, after making an inspection of the MAGLEV, Inc. fabricating technology, they reported the following;

> *...the introduction of your automated welding technology to the existing fabrication processes used nationwide to produce steel highway bridge girders could provide a dual benefit to the traveling, tax-paying public - more economical and more aesthetic bridges. This technology could position the steel bridge fabrication industry to better compete in the U.S. with concrete products, and internationally with both steel and concrete products. However, should U.S. fabricators not embrace this or similar enhancements to their fabrication processes, the U.S. steel fabrication industry may soon find themselves further behind their European and Far Eastern competitors, as indicated in the recent FHWA-sponsored scanning tour on the subject of steel bridge fabrication. This tour noted that the Europeans, Japanese and others are already using more advanced automated welding and automated inspection techniques than U.S. fabricators, but not as advanced as your process could soon be.*

Verification of the accuracy of the welding is done by a coherent laser radar measuring system that typically scans in 3D from a distance of approximately twenty feet, accurate to within one thousandth of an inch. If necessary, extreme accuracy measured to approximately 2-3 micrometers can be obtained for other, more precise non-manufacturing applications. (The thickness of a human hair is approximately 25 micrometers.)

(E) The reasonableness of the schedule for project implementation;

Schedules have been prepared and submitted to the FRA. A cost risk assessment by an independent contractor verifying and applying risk to the schedule has been performed. The Pennsylvania Project's schedule is consistent with those prepared for other maglev projects and for the project actually built in Shanghai, China. The EIS process in China was abbreviated, but actual construction was less than two years for a nineteen-mile long project.

(F) The thoroughness and quality of the project management plan;

Establishment of a 63-20 special purpose entity for project implementation has been proposed by the state and accepted by the FRA to be implemented for construction. The next steps are to progress preliminary engineering to final design using a design-build approach. A series of design-build contracts, including guideway, civil work, equipment and stations, will then be issued under the 63-20 organization.

(G) The sufficiency of system safety and security planning;

The safety of the Transrapid International technology has been thoroughly assessed and developed at the test track in Emsland, Germany as well as in Shanghai, China. As a subcontractor working through the PAAC, MAGLEV, Inc. has performed extensive fieldwork in the safety analysis of the system pertaining to electromagnetic fields, noise and vibration associated with the operation of the system. Moving into the project's final design stage, the next steps are the Americanization and certification of the system and guideway, working with the FRA, Transrapid International (the technology supplier), and the German government.

(H) The timing and amount of the project's future non-committed investments;

An update of the project's financial plan previously developed in conjunction with Citigroup (Smith Barney), Raymond James and PNC Bank will be updated as the project moves from the FEIS to the ROD. The base financial plan is included in the DEIS and can be found at: http://www.portauthority.org/PAAC/Portals/Capital/DEIS/DEISFrame.asp .

(I) The project's progress at the time of the application; towards compliance with environmental protection requirements;

Work on the Project Final Environmental Impact Statement (FEIS) has been completed and has been delivered to the FRA for publication in the Federal Register. Work is beginning on progress toward the Record of Decision (ROD).

(J) The comprehensiveness and sufficiency, at the time of the application, of agreements with key partners (particularly infrastructure owning railroads) that

will be involved in implementing the project;

There are no infrastructure-owning railroads involved in this application. There is no track sharing with steel-wheel railroads. There will be some right-of-way obtained from the Allegheny Railroad for the B-4 alignment between downtown Pittsburgh and the Monroeville/Penn hills station, but it will be grade separated with the maglev system elevated by at least sixteen feet.

Transrapid International, developers of the technology, and MAGLEV, Inc., developers of the steel fabricating technology and other software applications, are the key partners.

(K) The overall completeness and quality of the application, including the comprehensiveness of its supporting documentation;

The pre-application has been submitted by the Commonwealth of Pennsylvania. Complete supporting documentation from the NEPA process is available on-line in the form of the Draft Environmental Impact Statement (DEIS) at:
http://www.portauthority.org/PAAC/Portals/Capital/DEIS/DEISFrame.asp
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5. PRIORITY #5 – Sustainability of Benefits §5.1.2.2 Each application will be assessed based on the risk associated with the project's capacity to generate, as planned, its anticipated transportation and economic benefits. Factors to be considered include;

(A) The presence and quality of a financial plan that analyzes the financial viability of the proposed rail service;

The financial plan referenced in the Project DEIS and FEIS was developed by the combined effort of Citigroup (Smith Barney), Raymond James and PNC in 2003 per FRA guidelines under TEA-21 and was provided to the FRA. An update of the financial plan, estimated to take three months to complete, will be undertaken as the project progresses to a Record of Decision (ROD).

(B) The quality and reasonableness of revenue and operating and maintenance cost forecasts for benefiting Intercity Rail Passenger Service;

The projected revenue and cost information is based on the project's completed Environmental Impact Statement as required under the National Environmental Policy Act (NEPA).. Capital cost estimates for the Environmentally Preferred Build Alternative were prepared by MAGLEV, Inc., and are based on engineering plans, profiles and other engineering details and the use of the *PENNDOT Bulletin 50-Construction Cost Catalog* and other information for unit construction cost estimates. Cost information supplied by Transrapid International (developers of the maglevsystem) was also used in the development of the maglev system cost elements and operating and maintenance (O&M) costs. Experience based information associated with the deployment and operation of the system in Germany and China verifies the projected cost information.

(C) The availability of any required operating financial support, preferably from dedicated funding sources for the benefiting Intercity Passenger Rail Service(s);

Regarding the amount and source of funding needed to cover annual operating and maintenance expenses, there is none. The federal High-Speed Maglev Deployment Program requires all maglev projects to be financially self-sustaining following construction.

Contact, and the resultant friction caused by it, creates wear on the components in steel-wheel systems, but high-speed maglev has no contact points to create friction. Also, due to the precision fabrication technology applied to the fabrication of the project's guideway, its design and deployment are such that there is no routine or recurring track adjustment required (nor operationally acceptable) to maintain high- speed maglev service. Alternatively, steel-wheel-on-rail operations require intensive track maintenance to sustain proper gauge, elevation, cross level and other track standards that become more stringent with increased operating speeds. Maintaining these stringent standards is further compromised when the track is shared with heavy freight operations, a phenomenon that applies strong geometric forces to the rails and causes a shift in their alignment that necessitates constant correction. The absence of a similar maintenance requirement for high-speed maglev is based on the fact that there is no unintended shift or movement in the guideway.

The end result is that maintenance costs are less than half that of steel-wheel-on-rail systems and, therefore, no annual operations and/or maintenance subsidy would be required to support the operation of the high-speed maglev system.

(D) The quality and adequacy of project identification and planning;

The Pennsylvania Project was down selected from seven competitors under the TEA- 21 program as one of two projects that best satisfied requirements for the first deployment of high-speed maglev in the United States. Subsequently, the project has performed PE and the NEPA process to a camera-ready Final Environmental Impact Statement (FEIS) that has been delivered to the FRA.

(E) The reasonableness of estimates for user and non-user benefits for the project;

The benefits for the project include users' benefits that result primarily from expanded transportation options for the system users (measured as consumer surplus) and benefits to the public at large, including decreased congestion on other modes of transportation and reduced societal costs due to reduced pollution.

The system benefits were calculated using the ridership model previously presented. The model was used to produce consumer surplus expressed in dollars, reduction in regional vehicle-hours traveled (VHT) resulting from the maglev system, and reductions in regional vehicle-miles traveled (VMT) resulting from the maglev system. The VHT reductions were used to calculate highway congestion delay savings, while VMT reductions were used to calculate reductions in highway related air pollution. The benefits were calculated in accordance with *Procedures and Technical Methods for Transit Planning, U.S. Department* *of Transportation, 1986,* and procedures at the *Maglev Deployment Program, Travel Demand and Revenue Forecasting, workshop II*, conducted by the Federal Railroad Administration (FRA) for Maglev Deployment Program grant recipients on July 27, 1999.

(F) The reasonableness of the operating service plan, including its provisions for protecting the future quality of other services sharing the facilities to be improved;

An operating service plan was developed and submitted to the FRA in 2007. The system will utilize its own dedicated guideway and will not share tracks. Other services sharing the facilities include retail development in and near the stations, plus the enhanced intermodal connections. The other connecting passenger modes will be enhanced by the intermodal connection with the high-speed passenger service.

(G) The comprehensiveness and sufficiency, at the time of application, of agreements with key partners that will be involved in the operations of the benefitting Intercity Passenger Rail service, including the commitment of any affected host-rail carrier to ensure the realization of the anticipated benefits, preferably through a commitment by the affected host-rail carrier(s) to an enforceable on-time performance of passenger trains of 80% or greater;

The Pennsylvania High-Speed Maglev Project is a true high-speed rail passenger system and its alignment is a completely new, independent and separate rail right-of-way. Because the high-speed maglev alignment does not follow the alignment of any existing rail right-of-way, there are no host-rail carrier operations involved and the issue of ensuring the realization of anticipated benefits through a commitment of an affected host carrier is a moot point.

As advocated collectively through the Association of American Railroads (AAR), America's freight railroads, owners of nearly all of the railroad tracks in the U.S., **only supports the sharing of track at lower speeds** if the issues of safety, capacity, compensation and liability are adequately addressed.

The following is an excerpt from the Comments of the Association of American Railroads for filing in FRA docket FRA-2009-0045 – Capital Assistance for High Speed Rail Corridors and Intercity Passenger Rail Service: Public Input on Recovery Act Guidance to Applicants pursuant to the Notice posted by the FRA in the Federal Register of May 19, 2009:

Executive Summary

> Improved intercity passenger rail service offers great promise to our nation in many ways, but the starting point for discussion must be a common understanding of what it requires in new or existing rail infrastructure. At lower speeds, track generally can be shared between freight and passenger lines if the following interests are responsibly and fairly addressed: safety; capacity; compensation; and liability. **At higher speeds, tracks should be separated and dedicated, as they are in the overwhelming majority of high-speed rail systems around the world.** *(Emphasis added)*

The operating system in commercial operation in Shanghai, China has carried 18 million passengers over 3.3 million miles since 2004. With an on-time performance record of 99.8+ percent within one minute of schedule, the system far exceeds the expectations of all other proposals.

§5.1.3 OTHER ATTRIBUTES

6. (PRIORITY #6) – Timeliness of Project Completion §5.1.3.1 Each application will be assessed based on the timeliness of its implementation schedule, including;

(A) The readiness of the project to be commenced;

The project's camera-ready FEIS has been delivered to the FRA. With the next funding, the project is ready to proceed to final design and construction employing a design-build approach.

(B) The timeliness of project completion and the realization of the project's anticipated benefits;

The first segment, including the operations and control center, vehicle maintenance facility and three passenger stations can be completed in 2½ years from the date construction begins, dependent on the constant flow of funds to the project. Construction of the second segment from downtown Pittsburgh to Monroeville/Penn Hills can be completed within another 1½ to 2 years.

The realization of the project's anticipated benefits will begin prior to actual operation with the precision fabrication of the guideway and the demonstration of innovative construction methods that will carry over to other projects, including those beyond the transportation industry.