

TESTIMONY OF GILBERT E CARMICHAEL
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BEFORE THE
SUBCOMMITTEE ON SURFACE TRANSPORTATION
OF THE
COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION
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Mr. Chairman, distinguished members of the Committee, it is my privilege to appear before this Subcommittee to testify on behalf of the Department of Transportation on one of the most exciting developments in transportation in recent years -- magnetically levitated high speed ground transportation or Maglev.

Congestion on our highways and at our airports is constraining intercity mobility to the point that economic growth may soon be adversely affected. Maglev, with very safe operating speeds in excess of 300 mph, offers the potential to dramatically improve surface transportation mobility using a technology that is energy-efficient and environmentally sound.

At this time last week, Secretary Skinner and I were in Emsland, West Germany, gliding along in comfort at over 200 miles per hour in the prototype Transrapid maglev. I have met with the

designers of this system and of the system under development in Japan. And I have met with State and local officials and private developers who want to put up their own money to bring maglev to the United States. I have come away from those meetings with the belief that maglev has the potential to play a major role in this Nation's transportation system beginning in this decade and extending well into the next century.

Initial maglev systems would likely develop on a regional basis with distances up to 600 miles, absorbing excess highway and airline demand. High speed maglev systems, connecting regional airports as well as city centers, could provide an attractive alternative to short distance airline travel and could prove effective in relieving airport congestion. Regional maglev systems could ultimately expand to form a nationwide system.

There are basically two types of maglev systems being tested today. One works on the magnetic attraction principle where the vehicle underframe, which wraps around the guideway, is drawn up to within three-eighths of an inch of the bottom surface of the guideway. The German Transrapid system, now nearing the end of its prototype testing, is an example of the attraction technology. The other, the Japanese Railways' prototype, works on the magnetic repulsion principle, pushing the vehicle 4-6

inches above the guideway. As you know, much of the original research into maglev was conducted by the Federal Railroad Administration. During the FRA's period of active maglev research and development (R&D), Germany, Japan and other countries involved in maglev research shared the products of our efforts. We can see the embodiment of much of America's and DOT's own R&D developments in both the German and Japanese prototypes.

Although both the German and Japanese systems are in the full scale prototype testing stage, no high speed maglev system is presently in revenue service. The Germans have approved construction of a revenue service line to connect the Bonn/Cologne and Dusseldorf airports, a distance of approximately 50 miles. The Japanese, however, have decided to undertake further prototype testing and are considering the construction of a prototype test track in the suburbs of Tokyo.

Both the Germans and Japanese have made impressive advances in developing this technology, but I believe that there is a potential for a U.S. designed, advanced maglev system that could become the system of choice for future high speed ground transportation systems. The task before us now is to determine the appropriate role of the Federal Government in this development.

I will begin my testimony by describing the Department's role in maglev development, what we have done, what we are doing, and what we believe should be done in the future. I will then address the specific questions contained in your letter inviting me to testify here today.

PAST DOT EFFORTS IN THE DEVELOPMENT OF MAGLEV

The Department's earliest involvement with maglev dates from the High Speed Ground Transportation Act of 1965. Under that Act, we funded a wide range of research into all forms of high speed ground transportation. The Department rapidly became a world leader in maglev research and along with the National Science Foundation sponsored research which produced scale model demonstrations of the maglev concept. Research by the Department lead to the development of the linear motor, the motive power used by all current maglev prototypes. In 1974, a prototype linear induction motor research vehicle set a world speed record of 255.4 m.p.h. at the Department's Test Center in Pueblo, Colorado.

In recent years, the Department has funded feasibility studies by States considering high speed ground transportation systems and has been the catalyst for many efforts to define the potential for such systems, providing both seed money and technical assistance. Prominent among these are advanced projects proposed for Florida, Texas, Ohio, California/Nevada and Pennsylvania.

Finally, enactment of the Rail Safety Improvement Act of 1988 [45 U.S.C. 431(a)] specifically made the Federal Railroad Administration (FRA) responsible for establishing and enforcing maglev safety standards. We have restarted our maglev research, including a major initiative to provide a basis for maglev safety standards.

THE CURRENT STATUS OF MAGLEV IN THE U.S.

A number of States have investigated the feasibility of high speed maglev systems, and some have concluded that private maglev systems are feasible. The Florida High Speed Rail Transportation Commission is in the second phase in its process for awarding a franchise to build and operate a maglev line between Orlando Airport and the nearby theme park area, approximately 14 miles away. This line, which could begin construction as early as next year, would employ the German technology and be financed by Japanese banks. Public and private interests in Pittsburgh recently announced plans for a detailed feasibility study of a 27 mile link between the city's downtown and its airport using Transrapid Maglev and for developing maglev manufacturing activity in the Pittsburgh area. The Transrapid Maglev is likely to be a serious contender as the high speed ground transportation system to connect Las Vegas with the Los Angeles region.

CURRENT DOT MAGLEV-RELATED ACTIVITIES

As the agency responsible for the safety of maglev systems, the Department has initiated a major research and testing effort to ensure the safety of U.S. maglev systems. Research on the Transrapid system, the system proposed for the Florida project, is underway and is being accelerated to ensure that unresolved concerns with safety do not slow implementation. This work will evaluate the adequacy of the existing German safety standards covering this maglev system, the compliance of the system with these standards, and the need for additional standards for operation in the U.S.

FRA's initial safety research focuses on Transrapid and attractive maglev technology because it has been formally proposed for implementation in the U.S., but we also intend to cover repulsive levitation technology as represented by the Japanese design. Our first priority in these efforts is safety, and we are working with the developers of the systems to ensure that FRA safety standards and regulations are clear and timely so that they may be considered in future system design. We want safety built into the systems, not added later.

The Department is also assisting the Florida officials and developers in exploring the environmental issues related to the proposed Florida Maglev project, and will serve as the lead

agency for preparation of any Federally required environmental documentation.

The Department is exploring the use of existing transportation rights-of-way, such as the Interstate Highway System and freight rail lines. Preliminary assessments by the Federal Highway Administration have indicated that the location of maglev systems in Interstate Highway median strips may be technically feasible in certain corridors where not otherwise constrained by horizontal curvature limitations. We are continuing to explore this issue and will work with interested parties to develop mechanisms to expedite the requisite approvals where highway segments can be used in a project.

At the direction of the Congress' Appropriations Committees, FRA is studying the feasibility of commercial maglev in the U.S. That study will be completed in June 1990, and will provide an initial insight into maglev's market potential, the economic and technical feasibility of commercial maglev systems, and legislative and other institutional changes that would facilitate the development of U.S. designed and manufactured maglev systems. Although the study is still in progress, it is clear that both current maglev systems are still in the formative stage with some bugs to be worked out, including the rather substantial capital costs. This is a natural stage for any new technology, and it offers us the opportunity to improve on the existing technology

and develop the second generation of maglev in this country that would become the system of choice in the 21st century.

FUTURE DOT MAGLEV ACTIVITIES

As you are no doubt aware, the President's budget request for Fiscal Year 1991 includes a request for approximately \$10 million to explore the possibility of stepped-up U.S. efforts in maglev, \$6.15 million to the FRA and \$3.5 million to the Corps of Engineers. Building on previous R&D and results of the current feasibility study, that program is designed to determine the appropriate role for maglev in the U.S. transportation system, the economic feasibility, the appropriate safety and operating standards, and the remaining technologies that must be developed to achieve an efficient, economically sound and environmentally acceptable U.S. system. The goal of the program is to facilitate private development of an operational maglev system in the U.S. based on a domestically designed and manufactured technology.

To avoid possible duplication of efforts, Federal agencies with interests in maglev have established a mechanism to coordinate their efforts. The Federal Maglev Executive Committee which I have the privilege to chair, includes Major General Pat Kelly of the Corps of Engineers who serves as co-chairman, Jeffery Shane, Assistant Secretary for Policy and International Affairs of the Department of Transportation, Tom Larson, the Federal Highway Administrator and J. Michael Davis, Assistant Secretary for

Conservation and Renewable Energy of the Department of Energy. I have also extended an invitation to Administrator Reilly of the Environmental Protection Agency and Admiral Busey, the Federal Aviation Administrator, to be represented. The Committee will set policy for our coordinated maglev efforts, which we are calling the Federal Maglev Initiative. At the working level, the Federal Maglev Coordinating Committee is directing implementation of the programs and coordinating all Federal maglev efforts. In addition to the agencies represented on the Executive Committee, EPA, NASA and the Department of Commerce are participating in these efforts so that we can take advantage of their specialized expertise. We also expect to get input from the Surgeon General when we begin to address health related issues.

The process is working well. I believe the combining of the Department's expertise in transportation and in maglev technology with the expertise in other areas of the other Federal agencies will lead to thorough analysis and useful recommendations on the future of maglev in the U.S. The recommendations, to be completed in early 1992, will lay out the potential for maglev and the steps by the government and the private sector necessary to realize this potential.

VIEWS ON BILLS PENDING BEFORE THE SUBCOMMITTEE

In your letter inviting me to testify, you asked for my views on two pieces of legislation pending before this Subcommittee,

S.1898 - The Mag-Lev Guarantee Pilot Program Act, and S.2286 -
The Magnetic Levitation Act of 1990.

S.1898

S.1898 would create a program under which the Secretary would guarantee the unpaid principal and interest of loans to high speed intercity rail facilities, including maglev, from pension funds of State and local government workers. The intent of the bill is to encourage the development of high speed ground transportation systems. I too want to encourage the development of these systems, where they are appropriate, but unfortunately I have concerns with this bill.

The National Transportation Policy, unveiled by President Bush earlier this month, encourages consideration of high speed rail and maglev systems as alternatives to expensive expansion of airports and highways. There is widespread agreement among the parties involved in these projects that private investment will be the central element in building the systems, but that a role for the Federal Government is essential in implementing these technologies in the United States. The Policy recognizes the need for the Federal Government to provide leadership in research and development to advance the technologies for deployment in

the U.S. and to act as a catalyst to address regulatory and institutional barriers for the implementation of these systems. S.1898 would establish the Federal government, through its program of Federal guarantees of loans from pension plans to high speed rail systems, to be the primary player in guaranteeing funding of construction of these systems.

My concerns with S.1898 are threefold: First, I am not convinced that guaranteeing loans from state and local pension funds is an appropriate role for the Federal government to play. Second, the Federal guarantees, which could total \$10 billion, would cause a large increase in the Federal government's contingent liability at a time when we are struggling to reduce this Federal liability. My third concern is that extensive Federal guarantees would negate one of the most important benefits of private sector participation, the ability to successfully assess profit potential and balance it against risks and other uncertainties.

In my opinion, the States, localities and the private sector will build high speed ground transportation systems of proven technologies in areas where an adequate basis for such a service exists. Florida offers an excellent example. The State recognized the need for a high speed ground system connecting three of its major urban areas--Tampa, Orlando and Miami and

developed a mechanism for its financing under which a private sector developer of this system would receive certain real estate development rights that would enable the developer to capture some of the increase in real estate values resulting from the rail system. FRA's role in this project is to coordinate the requirements of the Federal agencies and to assist the State and its private partner in dealing with them. This mechanism appears to be working. The Florida High Speed Rail Corporation proposes to build a \$2.45 billion system funded totally in the private sector. They do not even plan to take advantage of Federal tax free industrial revenue bonds that would be available to help fund this project.

Your letter specifically asked for comments on that provision of S.1898 that would require rolling stock to be manufactured in the United States before it could qualify for the investment guarantees. This "buy American" provision is quite restrictive.

The Bush Administration supports free trade and is working to create a "level playing field" for international business free of such things as government incentives or subsidies that are designed to restrict imports. I, too, decry the lack of American builders of rail passenger equipment. But people should buy American products because they are the best, not because of some provision of law. American industry can produce the maglev system of choice worldwide if we set that as our goal and follow through.

S.2286

You also asked my views on S.2286 - The Magnetic Levitation Transportation Act of 1990. S.2286 directs the Department of Transportation, in cooperation with other Federal agencies and the private sector, to undertake a program of research and development leading to the deployment of advanced maglev systems in the United States.

One of the important initiatives of the National Transportation Policy that was recently announced by President Bush and secretary Skinner is a program of research and development in support of maglev and other promising technologies for improving our nation's transportation systems. As I stated FRA, in cooperation with other Federal agencies, has begun an effort in this area.

The bill authorizes appropriations to the Department of \$50 million in 1991 and \$50 million in 1992 for maglev related activities. The level for Fiscal Year 1991 varies significantly from the President's budget request. I would recommend that any authorizations be consistent with our budget request or be stated "such sums as may be necessary." The budget levels represent a considered plan for Federal support for maglev development in the United States.

I just came from a hearing on FRA's budget before a House Appropriations Subcommittee. I testified there that the \$6.15 million in the President's fiscal year 1991 budget for FRA together with the \$3.5 million of funding proposed for the Corps of Engineers, would be adequate to begin the Federal Maglev Initiative and to move toward a point in early 1992 where we can make recommendations about the future of maglev and the Federal government's role in its development.

I also have a few minor suggestions for changes to S.2286 which I feel are necessary to give us the tools we need to accomplish our task, and to clarify provisions which might be the source of some confusion. A key one that I will comment on today involves Section 6 which states that it shall be a function of FRA to establish national uniform standards for high speed rail and magnetically levitated superconducting transportation systems. There is the potential for confusion with this provision. It is not yet clear to me that there ultimately will be a need for Federal standards for these systems, other than in the area of safety, but I do agree that FRA is the appropriate agency to set such standards if they are needed. My other concern with this section is that it specifies standards for superconducting maglev which is just one of the two radically different maglev systems

in the prototype stage today, and there are several other less developed concepts. As an example, the system I rode last week, which is one that may be built in Florida next year, does not use superconducting magnets. I believe that the bill should make it clear that the Department has the authority to issue such standards as it may deem appropriate, and that the authority to set standards for maglev should be broad enough to cover any potential maglev technology.

The United States has a long history of scientific and technological breakthroughs that have permitted advances in transportation worldwide. The Department's Transportation Policy Statement, which was announced earlier this month by President Bush and Secretary Skinner, builds on that expertise and supports a Federal initiative to assess the possibility of such a breakthrough with maglev. The Federal Government will serve as a catalyst in the process by supporting research and development of technical issues and working to ensure that regulatory and institutional barriers do not impede implementation of cost-effective, environmentally sound transportation options like maglev.

Maglev systems offer an infrastructure alternative that is less disruptive, and possibly less expensive, than the construction of new highways or airports. These maglev systems can wear the

"Made in the USA" label if we all, Federal and State Governments and the private sector, pool our efforts toward that common goal.

Mr. Chairman, this concludes my statement and I will be happy to answer any questions that the Subcommittee might have.