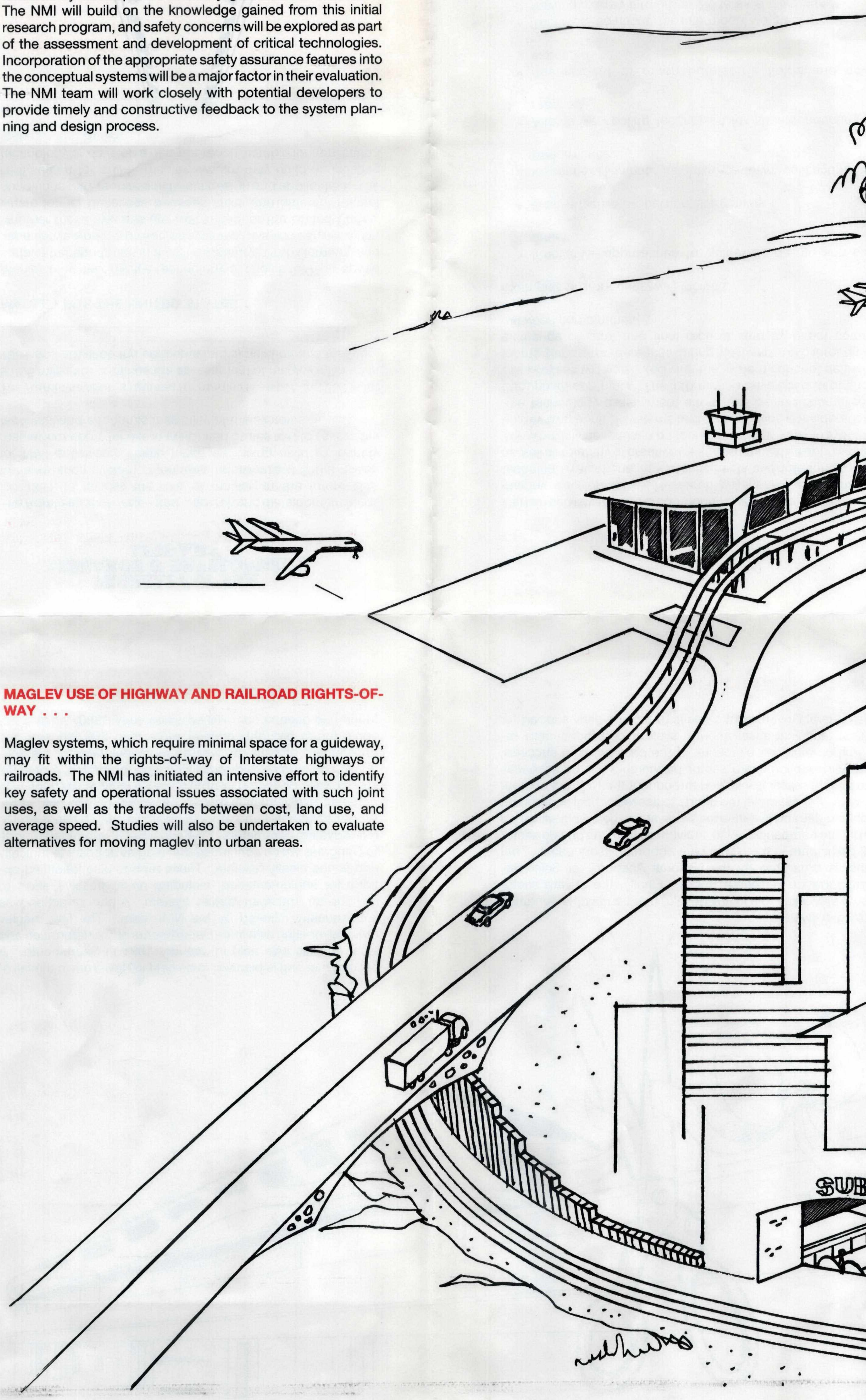
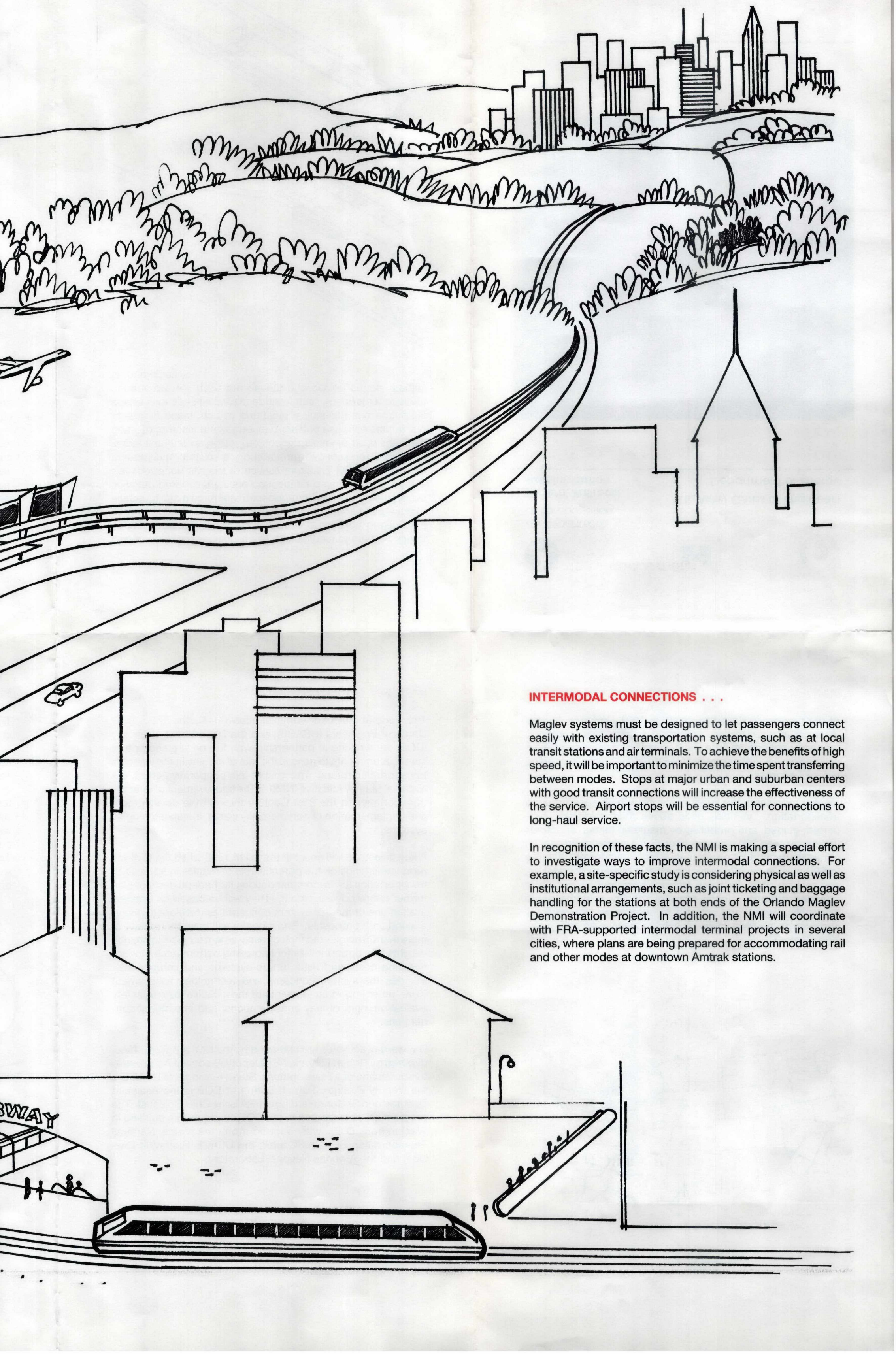
SAFETY . . .

As a result of the likely introduction of first generation German maglev systems into the U.S. in the near future, FRA has initiated a safety research program to ensure the safe design and operation of these systems. The first such project is likely to be the 14-mile Orlando Maglev Demonstration, connecting Orlando Airport to International Drive, a Florida resort area. The safety research effort involves a review of safety assurance features incorporated into existing prototype systems, to be followed by development of safety guidelines or standards. The NMI will build on the knowledge gained from this initial research program, and safety concerns will be explored as part of the assessment and development of critical technologies. Incorporation of the appropriate safety assurance features into the conceptual systems will be a major factor in their evaluation. The NMI team will work closely with potential developers to provide timely and constructive feedback to the system planning and design process.

MAGLEV USE OF HIGHWAY AND RAILROAD RIGHTS-OF-WAY . . .

Maglev systems, which require minimal space for a guideway, may fit within the rights-of-way of Interstate highways or railroads. The NMI has initiated an intensive effort to identify key safety and operational issues associated with such joint uses, as well as the tradeoffs between cost, land use, and average speed. Studies will also be undertaken to evaluate alternatives for moving maglev into urban areas.





INTERMODAL CONNECTIONS . . .

Maglev systems must be designed to let passengers connect easily with existing transportation systems, such as at local transit stations and air terminals. To achieve the benefits of high speed, it will be important to minimize the time spent transferring between modes. Stops at major urban and suburban centers with good transit connections will increase the effectiveness of the service. Airport stops will be essential for connections to long-haul service.

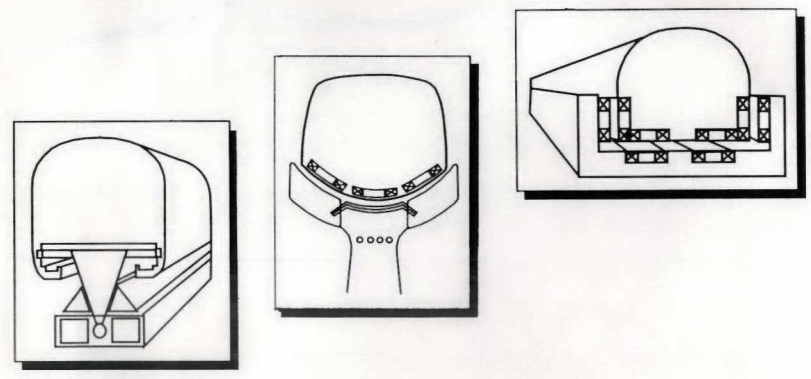
In recognition of these facts, the NMI is making a special effort to investigate ways to improve intermodal connections. For example, a site-specific study is considering physical as well as institutional arrangements, such as joint ticketing and baggage handling for the stations at both ends of the Orlando Maglev Demonstration Project. In addition, the NMI will coordinate with FRA-supported intermodal terminal projects in several cities, where plans are being prepared for accommodating rail and other modes at downtown Amtrak stations.

CRITICAL TECHNOLOGIES . . .

Certain sub-systems and components are critical to successful maglev development. Research will generate a series of technical evaluations, risk assessments and tradeoff studies, as well as a variety of creative ideas and innovative approaches. The work will be focused on four main areas: vehicle systems, guideways, control systems and system-wide considerations. The technology assessment efforts are being accomplished through 28 contracts. The information developed throughout this process will be shared with the system concept definition teams, through conferences during 1991 and 1992, through the exchange of draft and final reports, and by direct contact between participants.

Examples of work underway include:

- Innovative approaches to guideway design and construction.
- Cost-effective propulsion alternatives.
- Influence of levitation height on guideway cost and vehicle performance.
- Alternative cooling techniques for superconducting lift magnets.
- Assessment of magnetic/electric fields and noise exposure.
- Technical solutions for intermodal connections and for moving maglev into urban centers via rail routes.



NATIONAL MAGLEV INITIATIVE FUNDING . . .

The Administration requested research and development funds for 1991 to assess the role of maglev in the future U.S. transportation system. Congress appropriated $10.2 million for NMI activities. These funds are being used to identify maglev concepts for use in the United States and to assess the technical and economic feasibility of the systems.

The Administration's request for maglev research in 1992 is for $19.5 million to continue the assessment of maglev initiated in 1991 and advance the concepts into simulation and testing.

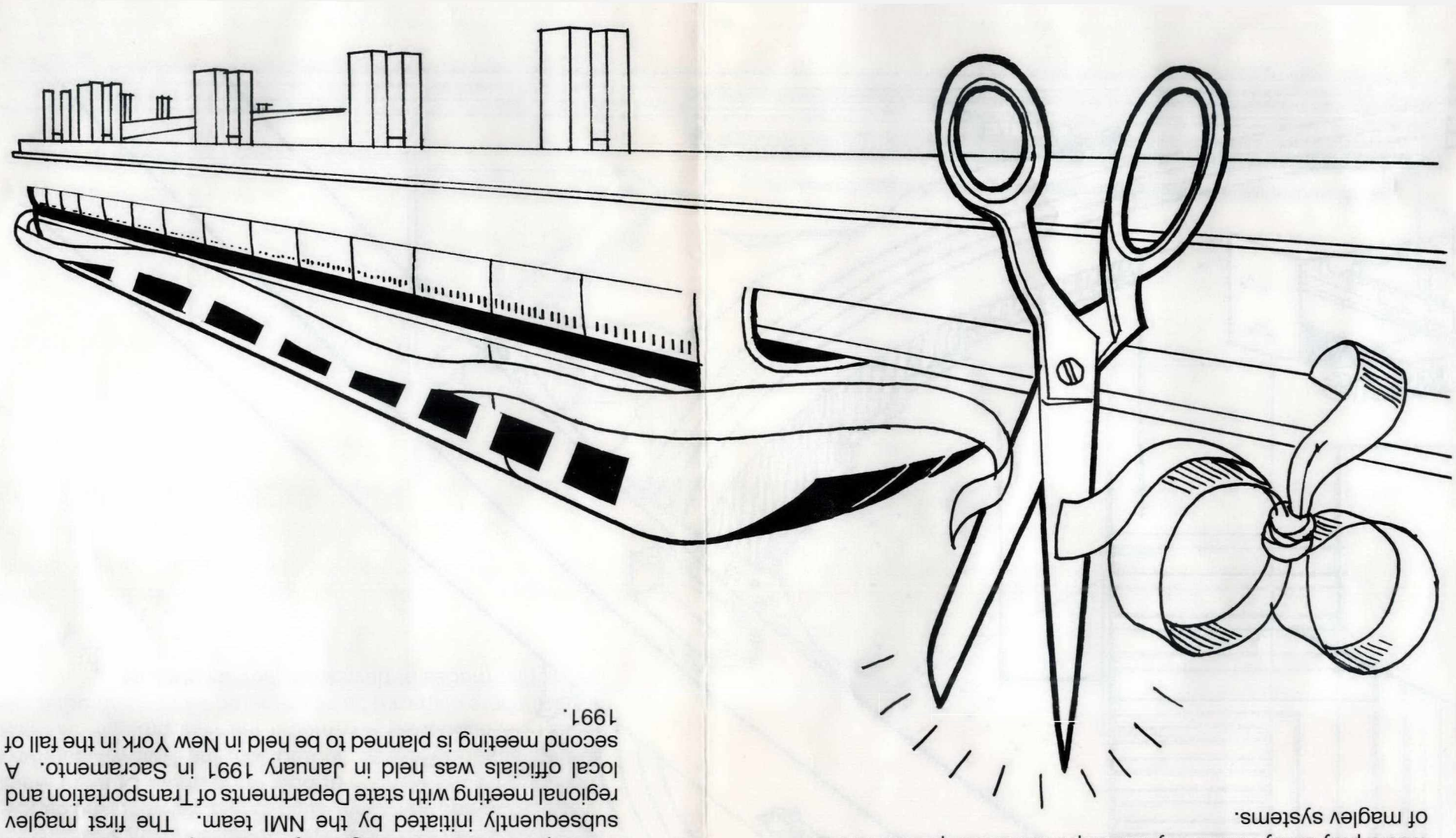
MAGLEV FOR THE UNITED STATES . . .

Maglev may become the technology of choice for high-speed surface transportation in the 21st Century. Both Germany and Japan have working prototype systems. It is unclear, however, whether these systems are well suited for the United States, where longer distances between cities and different market conditions may require a different design and application. The NMI search for a U.S. maglev system may build on existing technology or develop a new approach suitable for application in the United States.

National MAGLEV Initiative, Moving America, New Directions, New Opportunities, US DOT, FRA, US Army Corps of Engineers, Department of Energy, 1994 -11-Advanced Systems

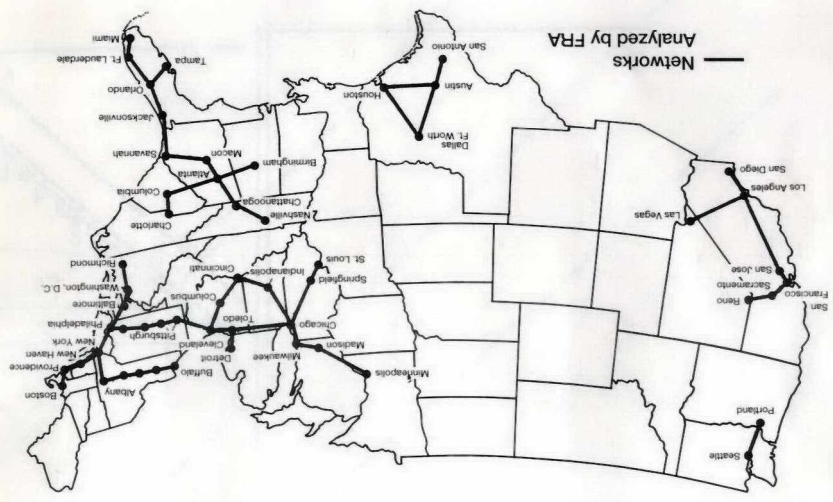
PUBLIC/PRIVATE PARTNERSHIP . . .

The Federal Government's role is to provide early support for critical technical assessments, system definitions, and research on high risk elements. If the program is to succeed, however, public/private sector partnership will be essential. The private sector is involved throughout the NMI in a number of ways. For example, the efforts to assess critical component technologies and to define maglev systems concepts will be led by private companies. Also, individuals from the private sector will participate in the NMI's blue ribbon advisory panel. That panel is organized by the National Academy of Sciences, Transportation Research Board. Finally, the private sector would play a key role in any development and implementation of maglev systems.



LAUNCHING THE NATIONAL MAGLEV INITIATIVE . . .

Much has been accomplished since early 1990, when a national forum brought together more than 200 industry and government officials, as well as representatives of the academic community, to discuss NMI work programs. A national survey was conducted to obtain the views of major firms with potential involvement in maglev. A workshop was held at the Argonne National Laboratory to identify research needs and to refine system parameters. FRA and USACE submitted reports to Congress which concluded that maglev appears technically and economically feasible. These reports also identified options for implementation, including an aggressive effort to develop an American maglev system. A plan of action was subsequently initiated by the NMI team. The first maglev regional meeting with state Departments of Transportation and local officials was held in January 1991 in Sacramento. A second meeting is planned to be held in New York in the fall of 1991.



At the request of President Bush, in 1991 Congress funded research in a promising, advanced transportation technology—magnetically levitated high speed ground transportation, or "maglev." A further request for FY 1992 is currently pending before Congress.

Maglev represents the latest evolution in high speed ground transportation. Vehicles glide above their guideway, supported, guided, and propelled by magnetic forces, at speeds that can exceed 300 miles per hour. Such systems can offer an attractive transportation alternative for many trips of 100 miles to 600 miles in length, reducing air and highway congestion, and making room for more efficient long-haul air service at crowded airports. Initial regional maglev systems could eventually expand and connect to become an inter-regional and even a nationwide network helping to move America in the 21st Century.

MAGLEV . . .

U.S. Department of Transportation
Federal Railroad Administration

U.S. Army Corps of Engineers
Department of Energy

NATIONAL MAGLEV INITIATIVE

Moving America
New Directions, New Opportunities

The Federal Railroad Administration (FRA), the U.S. Army Corps of Engineers (USACE), and the Department of Energy (DOE) are working in partnership with the private sector and state governments to assess the role of maglev in the Nation's transportation future. The goal of this cooperative effort, the National Maglev Initiative (NMI), is the improvement of intercity transportation in the 21st Century through the development and implementation of commercially viable, advanced maglev systems.

A key milestone will occur in the fall of 1992 when the NMI will produce findings on the potential role of maglev in future U.S. transportation and recommendations for Federal decisions on further maglev development. They will be based on detailed evaluations of maglev system concepts as developed in several industry proposals. The industry will have the benefit of more than 25 maglev technology assessment projects to provide insights into opportunities for improving performance, and for reducing costs and risks of sub-systems and components. Besides the system concepts and technology assessment work, other important elements of the initiative include safety evaluation, right-of-way considerations, and intermodal connections.

Day-to-day activities are managed by the NMI program office, directed by Robert L. Krick, FRA Deputy Associate Administrator for Technology Development. Stuart Kissinger of USACE is the Deputy Director; Patrick Sutton of DOE is the Assistant Director; and Dr. John Harding of FRA is the Chief Scientist. The program office is located in the DOT headquarters building in Washington, D.C., with support from the Volpe National Transportation Systems Center, the USACE Huntsville Division, and the Argonne National Laboratory.

NATIONAL MAGLEV INITIATIVE . . .

CONCEPTUAL MAGLEV SYSTEMS . . .

Levitation or suspension is just one element of maglev. Other critical elements include the guideway, propulsion, braking and control. There are many possibilities for combining the major elements into a complete transportation system. The NMI has solicited proposals for the conceptual definition of a maglev transportation system to assess technical feasibility, performance limits, and costs. Contracts are expected to be awarded in late summer of 1991. The concepts should be in sufficient detail to forecast market penetration and estimate capital and operating costs, and to complete a financial and economic analysis for specific market applications. The system concept contractors will have the benefit of work on critical maglev technologies.

Light Single Vehicles at Offline Stations

Long High Capacity Trains

MAGLEV . . .

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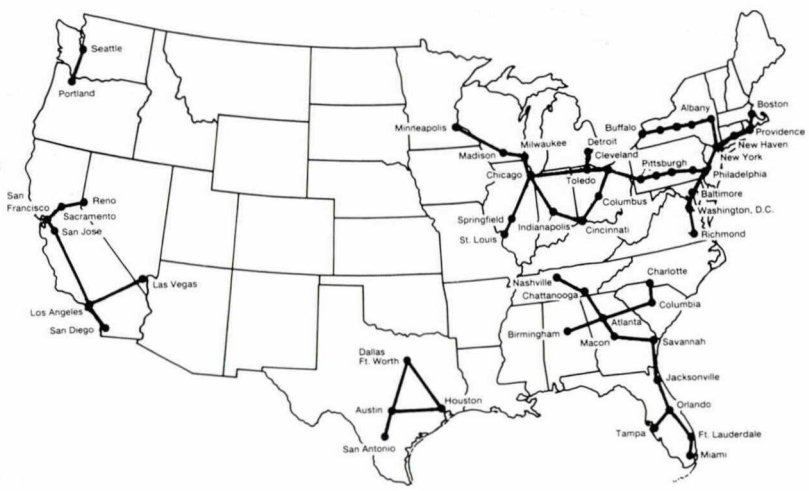

— NETWORKS ANALYZED IN 1990 REPORT TO CONGRESS

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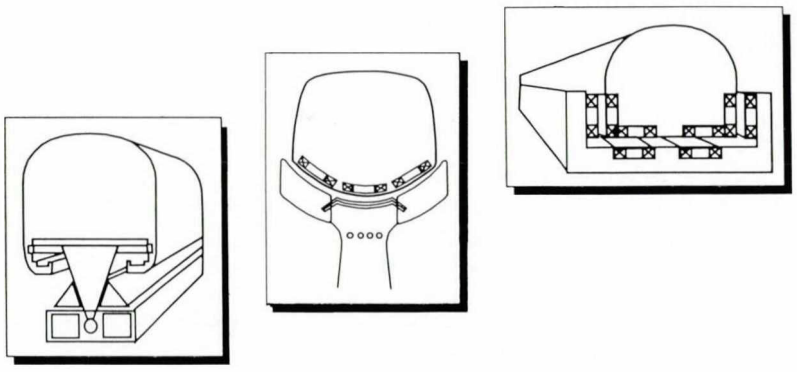
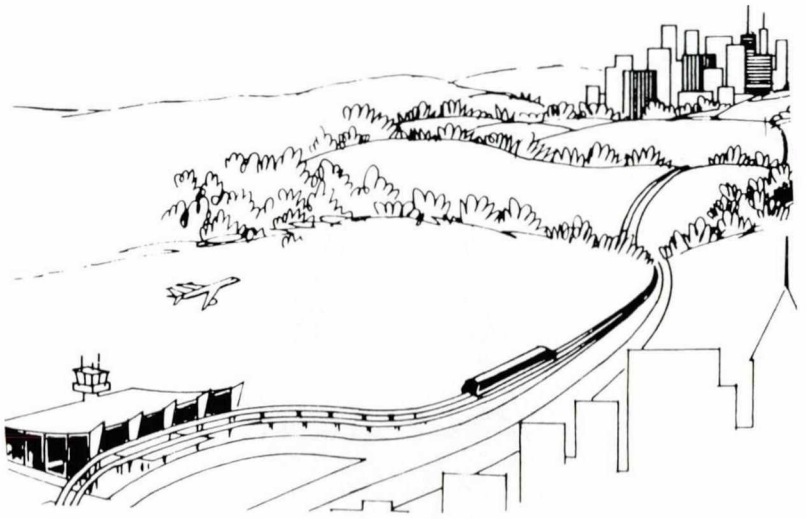
A key milestone will occur in the spring of 1993, when the NMI will produce findings on the potential role of maglev in future U.S. transportation and recommendations for decisions on further maglev development. They will be based on detailed evaluations of maglev system concepts as developed in four industry contract studies, to be completed in late September 1992. The industry will have the benefit of more than 25 maglev technology assessment studies to provide insights into opportunities for improving performance, and for reducing costs of subsystems and components. These studies include analyses addressing innovative approaches to guideway design and construction, cost-effective propulsion alternatives, vehicle-guideway interaction issues, and system-wide considerations, such as magnetic/electric field and noise exposure. Besides the system concepts and technology assessment work, other important elements of the initiative include market and economic studies, safety evaluation, right-of-way considerations, and intermodal connections.



OTHER SPECIAL STUDIES . . .

Safety – As a result of the likely introduction of first generation German maglev systems in the U.S. in the near future, FRA has initiated a safety research program to ensure their safe operation. The first such project is likely to be the 14-mile Orlando Maglev Demonstration, connecting Orlando Airport to International Drive, a Florida resort area. Safety assurance features are being reviewed and will be incorporated into existing prototype systems, to be followed by safety guidelines or standards.

Use of Highway and Railroad Rights-of-Way – Maglev systems, which require minimal space for a guideway, may fit within the rights-of-way of interstate highways or railroads. NMI studies are evaluating key operational and safety issues associated with such joint uses, as well as the tradeoffs between cost, land use, and average speed.



Intermodal Connections – Maglev systems must be designed to allow passengers to transfer easily to other modes at urban and suburban centers and at airports. The NMI is making a special effort to investigate ways to improve intermodal connections. For example, a site specific study is considering physical as well as institutional arrangements for joint ticketing and baggage handling for the Orlando Maglev Demonstration.

NATIONAL MAGLEV INITIATIVE FUNDING . . .

To assess the role of maglev in the future U.S. transportation system, Congress appropriated $10.2 million for NMI activities in FY 1991 and $16.0 million in FY 1992. These funds are being used to identify maglev concepts for use in the United States and to assess the technical and economic feasibility of the systems.

The administration's request for maglev research in 1993 is for $22.0 million to continue the assessment of maglev markets and technological issues.

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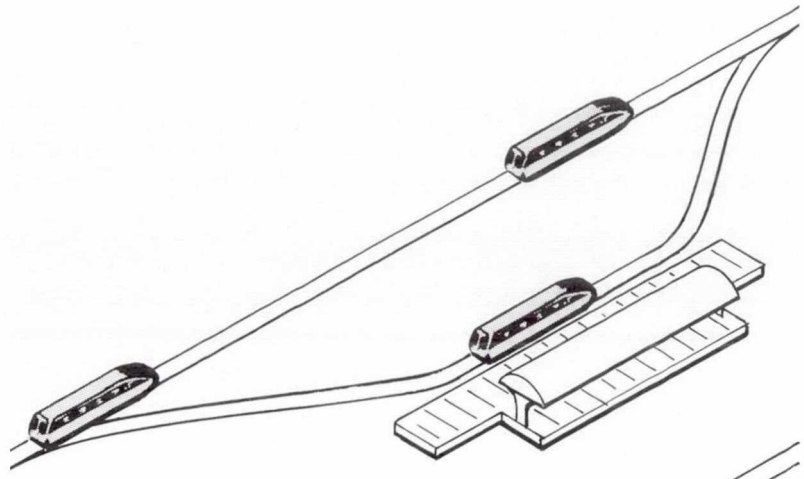

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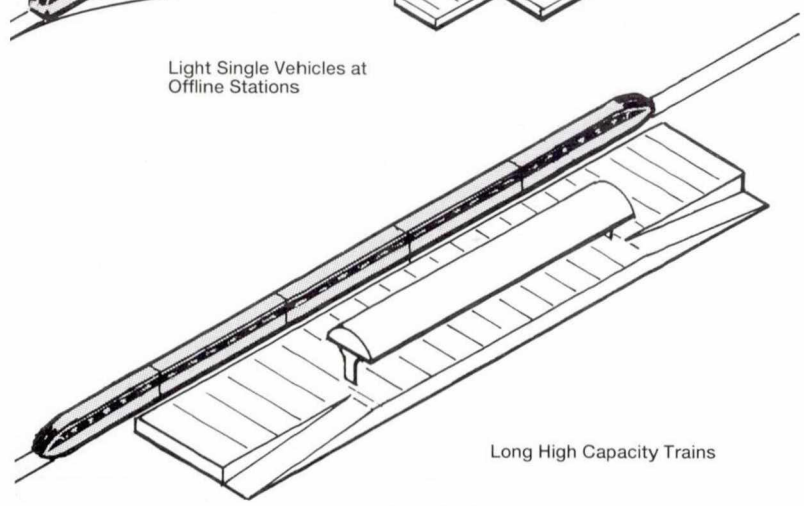

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PUBLIC/PRIVATE PARTNERSHIP . . .

The Federal Government's role is to provide early support for critical technical assessments, system definitions, and research on high risk elements. If the program is to succeed, however, public/private sector partnership will be essential. The private sector and the academic community are the principal source of expertise throughout the NMI work. Assessments of critical component technologies and definition of maglev system concepts are being accomplished by private companies. Also, fifteen experts from the private sector and the academic community serve on the NMI's blue ribbon advisory panel. That panel is organized by the Transportation Research Board of the National Research Council. Finally, the private sector would play a major role in any development and implementation of maglev systems.

INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991 . . .

On December 18, 1991, President Bush signed into law the Inter-modal Surface Transportation Efficiency Act of 1991 (ISTEA), a six-year $151 billion bill that gives new emphasis to non-highway forms of transportation. In its Declaration Of Policy, the Act states that the "National Intermodal Transportation System (NITS) shall consist of all forms of transportation, in a unified interconnected manner, including the transportation systems of the future, to reduce energy consumption and air pollution while promoting economic development . . ." The NITS "shall be adapted to 'intelligent vehicles,' **'magnetic levitation systems,'** and other new technologies where feasible and economical."

The Act includes a section on NATIONAL HIGH-SPEED GROUND TRANSPORTATION PROGRAMS that states the policy of the United States "to promote the construction and commercialization of high-speed ground transportation systems, by conducting economic and technological research; demonstrating advancements in high-speed ground transportation technologies; establishing a policy for the development of such systems and the effective integration of the various high-speed ground transportation technologies; and minimizing the long-term risks of investors."

The principal maglev feature of the Act is the National Maglev Prototype Development Program, financed over a six-year period by $500 million from the Highway Trust Fund and $225 million to be appropriated from the General Fund of the Treasury. Section 1036 (a) states the "it is the policy of the United States to establish in the shortest time practicable a U.S. designed and constructed magnetic levitation transportation technology capable of operating along Federal-aid highway rights-of-way, as part of a national transportation system of the United States."

U.S. Department of Transportation
Federal Railroad Administration

U.S. Army Corps of Engineers
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National MAGLEV Initiative

Moving America
New Directions, New Opportunities

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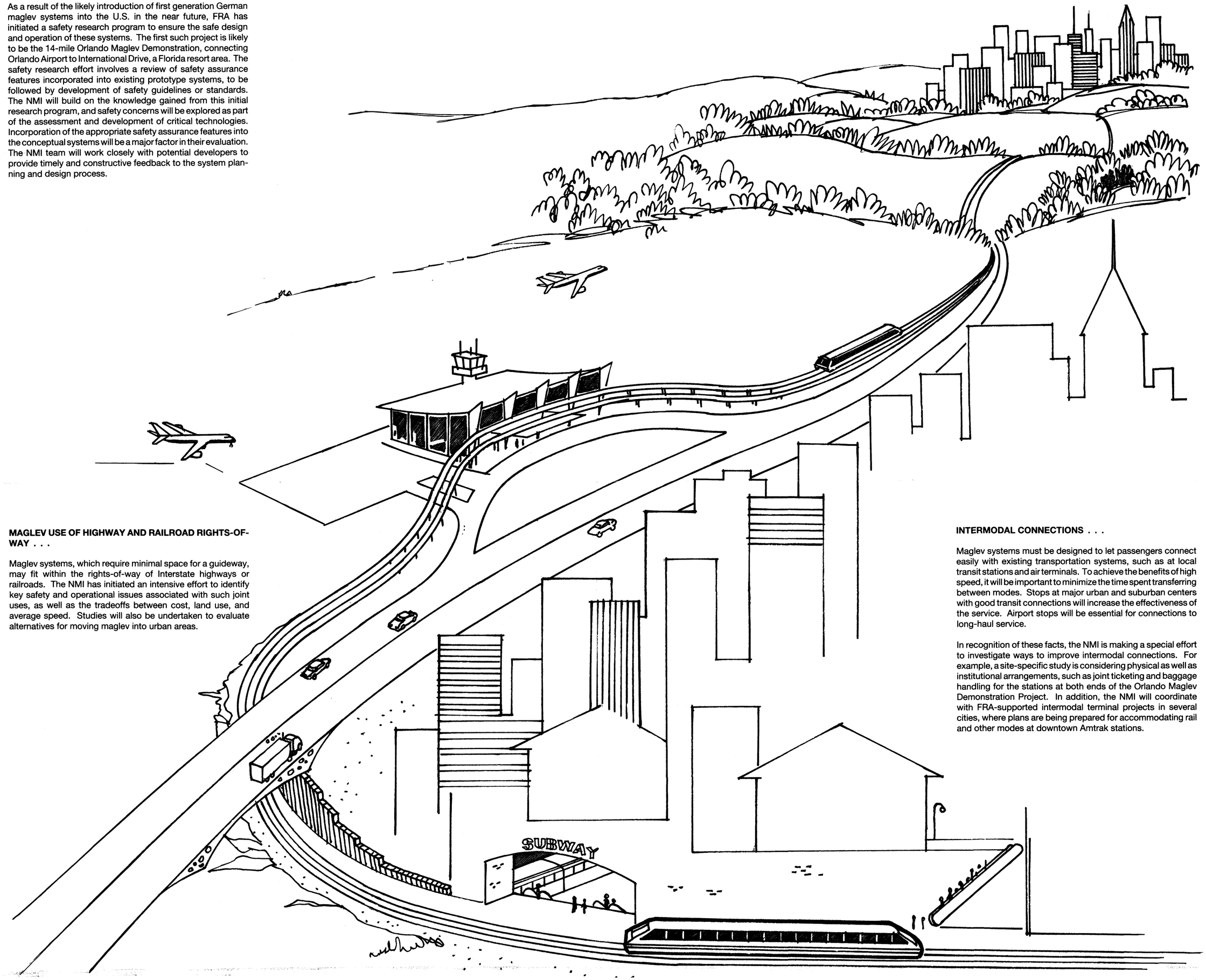

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