Chapter 1
BACKGROUND

This report examines the economics of bringing high-speed ground transportation (HSGT) to well-populated groups of cities throughout the United States. The intention is to draw nationwide—not corridor-specific—conclusions from projections of the likely investment needs, operating performance, and benefits of HSGT in a set of illustrative corridors in several regions. Although useful collectively, these case studies cannot substitute for the more detailed, State- and privately-sponsored analyses of specific corridors that would be prerequisite to HSGT implementation.

Congressional interest in HSGT dates back at least to 1965, with the passage of the High Speed Ground Transportation Act. This legislation, initially authorized at $90 million, started a Federal effort to develop, and demonstrate where possible, contemporary and advanced HSGT technologies. Under the HSGT Act, the Office of High-Speed Ground Transportation of the Federal Railroad Administration (FRA) introduced modern HSGT to America in 1969 by deploying the self-propelled Metroliner cars and the Turbotrain in Northeast Corridor revenue service. Simultaneously, the construction of new suburban rail stations at Metropark (Iselin), New Jersey, and Capital Beltway (Lanham), Maryland significantly improved access to the new HSGT service. Although catalyzed by the Federal Government, these Washington—New York—Boston service improvements represented a private/public partnership between the freight railroad companies, the equipment suppliers, States, localities, and the FRA.[1] The HSGT program also included a comprehensive multimodal transportation planning effort focusing on long-term needs in the Northeast Corridor "megalopolis,"[2] as well as a pioneering research and development program in such advanced technologies as tracked air-cushion vehicles, linear electric motors, and magnetic levitation (Maglev) systems.

The Rail Passenger Service Act of 1970 led to the creation of the National Railroad Passenger Corporation (Amtrak) in 1971 as a way of ensuring continued operation of an intercity rail passenger network in the United States. On May 1, 1971, Amtrak took over from the freight railroads the responsibility for operating intercity rail service in most of the United States, including the Northeast Corridor.

The research, planning, development, and demonstration efforts under the HSGT Act converged to recommend improved high-speed rail in the Northeast Corridor as the optimal response to steadily increasing congestion and decreasing service quality in the other

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[1] Walter Shapiro, "The Seven Secrets of the Metroliner's Success," *The Washington Monthly*, March 1973, pp. 7 ff.

[2] So termed by Senator Claiborne Pell in his book Megalopolis Unbound.

intercity modes.[3] While the Metroliners and Turbotrain had demonstrated the potential of HSGT, the Boston-Washington route infrastructure was still suffering from decades of deferred maintenance. Thus, when HSGT Act appropriations ended in 1975, the focus of Congressional efforts shifted to upgrading the Northeast Corridor infrastructure with the objective of enhancing reliability and allowing shorter trip times, particularly between New York City and Washington, D.C. Pursuant to Title VII of the Railroad Revitalization and Regulatory Reform Act of 1976,[4] a total of $3.3 billion[5] has been appropriated to date for the Northeast Corridor Improvement Project (NECIP), a massive engineering and construction effort which has improved major sections of the main line by means of track reconstruction, new signal and control systems, elimination of many highway/railroad grade crossings, construction of maintenance-of-way bases and maintenance-of-equipment facilities, improvements to stations, and bridge replacement and repair. In addition to providing the foundation for a reliable HSGT intercity service in the Northeast, the NECIP has also benefited commuter rail operators by effectively increasing the operating flexibility of the Northeast Corridor. The marketplace success of HSGT in the Northeast endures as the legacy of these early Federal HSGT efforts[6] and has encouraged ongoing efforts to achieve analogous service standards between Boston and New York City.

Federal HSGT emphasis in the 1980's shifted to studies of potential HSGT corridors. Among those efforts was a series of reports on "Emerging Corridors," developed in conjunction with Amtrak, which were issued in 1980 and 1981. In 1984, grants of $4 million were set aside for HSGT corridor studies on the State level under the Passenger Railroad Rebuilding Act of 1980.[7] The law included authority for engineering and design studies. This program funded about seven major HSGT analyses in various corridors.

As Federal involvement in HSGT planning continued during the 1980's, State involvement also increased. By 1986, at least six States had formed high-speed rail entities, and ultimately Florida, Ohio, Texas, California, and Nevada awarded franchises to private-sector consortia to build and operate intercity high-speed rail or Maglev systems. For a variety of reasons, none of these proposals has yet led to construction. Learning from such challenges, the States have persisted in—and in some cases redoubled—their HSGT efforts. Exemplifying this growing State interest in HSGT technologies is New York, which in the 1980's invested heavily in upgrading the New York City—Albany portion of the Empire Corridor to 110 mph (with some Federal funding assistance) and which recently undertook an intensive equipment demonstration program. Today, more than 15 States have passed

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[3] U.S. Department of Transportation, *Improved High-Speed Rail in the Northeast Corridor,* 1973.
[4] 45 U.S.C. 851 et seq.
[5] *Amtrak's Northeast Corridor: Information on the Status and Cost of Needed Improvements,* General Accounting Office, Washington, DC, GAO/T-RECD-95-151BR, April 13, 1995, p. 24.
[6] Amtrak's services carry 45% of the combined air-rail traffic in the New York-Washington city pair, according to Amtrak's *1994 Annual Report*, p. 4.
[7] Pub. L. 96-254

enabling legislation facilitating HSGT activities. Some States, moreover, are attempting to implement HSGT, as exemplified by Florida's recent selection of—and continuing cooperation with—Florida Overland Express as its private partner in the Miami—Orlando—Tampa corridor development.

In the late 1980's, Congress sought further information on Maglev, requesting FRA to assess the potential for Maglev technology and systems in the United States.[8] Accordingly, FRA submitted a preliminary Maglev report to Congress[9] in June 1990. In 1991, the National Maglev Initiative (NMI) was launched,[10] with an initial appropriation of $12 million. The NMI was a cooperative effort among the Department of Transportation, the U.S. Army Corps of Engineers, and the Department of Energy, directed at system concepts for Maglev development, market analysis, and safety issues.[11]

A key element of Congressional interest in HSGT has been to ensure the safety of new technologies. The Rail Safety Improvement Act of 1988[12] extended the statutory definition of "railroad" in the Federal Railroad Safety Act of 1920 to include "all forms of non-highway ground transportation that runs on rails or electromagnetic guideways," including "high-speed ground transportation systems that connect metropolitan areas, without regard to whether they use new technologies not associated with traditional railroads." In response to this direction, FRA examined a variety of safety issues—including collision avoidance and accident survivability, biological effects of Maglev magnetic field exposures, and fire safety—to determine required regulatory activity with respect to HSGT safety. Technical reports have been issued on these subjects.[13] FRA has also entered into several study agreements with other national governments to exchange information concerning HSGT safety systems.

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[8]As directed by the conference report accompanying the FY 1989 Department of Transportation and Related Agencies Appropriations Act (H. R. Rept. No. 957, 100th Cong.(1988)).

[9]U.S. Department of Transportation, *Assessment of the Potential for Magnetic Levitation Transportation Systems in the United States*, June 1990.

[10]Also in 1991, the Office of Technology Assessment issued a study of Maglev and tiltrotor technology, entitled New Ways, which discussed funding issues and options.

[11]The NMI also received direction from a Transportation Research Board "Committee for the Critique of the Federal Research Program on Magnetic Levitation Systems." Cf. FRA, U.S. Army Corps of Engineers, and U.S. Department of Energy, *Final Report on the National Maglev Initiative*, September 1993.

[12]49 U.S.C. 20102

[13] Among the reports covering HSGT safety are *Safety of High Speed Guided Ground Transportation Systems*-Four Volumes, U.S. Department of Transportation, Federal Railroad Administration, DOT-VNTSC-FRA-93-2, March 1993; *Safety of High Speed Magnetic Levitation Transportation Systems*, U.S. Department of Transportation, Federal Railroad Administration, DOT-VNTSC-FRA-93-10, September 1993; and *An Assessment of High-Speed Rail Safety Issues and Research Needs*, U.S. Department of Transportation, Federal Railroad Administration, DOT/FRA/ORD-90/04, May 1990.

In 1991 the Senate passed a High-Speed Rail Transportation Act[14] that would have encouraged research, development, design, and implementation of Maglev and other HSGT technologies in the United States and would have promoted domestic manufacturing efforts. The bill also required a study of HSGT commercial feasibility, evaluation of potential domestic Maglev designs which could be used in development of a full-scale prototype, and adoption of a national high-speed rail policy.

Key provisions of the proposed High-Speed Rail Transportation Act were ultimately incorporated into the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA),[15] which mandated this study.[16] Section 1036 of ISTEA[17] authorized a National High-Speed Ground Transportation Program at $800 million, including $725 million for development of a U.S.-designed Maglev prototype, $50 million for demonstration of new HSGT technologies, and $25 million for research and development. Funding for development of a Maglev prototype has not been requested by the Executive Branch or appropriated by Congress and remaining authorizations for the Maglev prototype have been rescinded. Similarly, although ISTEA amended the Railroad Revitalization and Regulatory Reform Act of 1976 to authorize up to $1 billion in government-guaranteed loans to help finance construction of high-speed rail systems, no such loan program has received appropriations.

Separately, section 1010 of ISTEA[18] authorized the designation of five high-speed rail corridors by the Secretary of Transportation, and provided $30 million for the elimination of highway/rail grade crossings in these corridors.[19] To date the funds have been used on grade crossing projects in California, Florida, Illinois, Indiana, Michigan, North Carolina, Oregon, Virginia, Washington, and Wisconsin. The Swift Rail Development Act, which was enacted into law in November 1994 with Executive Branch support, authorized $184 million for FY 1995 through FY 1997 for corridor planning and technology improvements.[20]

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[14] S.811

[15] P.L. 102-240, 105 Stat. 1914

[16] 49 U.S.C. 309d

[17] 105 Stat. 1978

[18] 105 Stat. 1934

[19] Further definition of these Section 1010 corridors appears in Chapter 3, where they are presented as illustrative corridors in this study.

[20] For FY 1995, $17.5 million was appropriated for technology improvements only; State planning funds were not appropriated. For FYs 1996 and 1997, appropriations were as shown in the following table (amounts are in millions of dollars):

Fiscal Year	State Planning	Technology Improvements	Administration	Total
1996	$1.25	$22.50	$0.38	$24.13
1997	$1.25	$24.45	$0.48	$26.18

This study may therefore be viewed as a continuation of many years of Congressional, Executive Branch, State, local, and private interest in the development of HSGT technologies and services. The study also lays the groundwork for HSGT policy and may assist State and local governments, private firms, and others as they weigh further efforts towards implementing HSGT in the United States.