

The Northeast Corridor: has research influenced policy?

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INTRODUCTION

The U.S. government recently initiated a program of high-speed rail passenger improvements along 457 miles of railroad extending from Washington, D.C. in a northeasterly direction through New York, New York to Boston, Massachusetts. This rail route is termed the Northeast Corridor (hereafter NEC). The improvement project and its implementation, now underway, are briefly described in order to define current U.S. policy.

This paper examines the background and development of the NEC improvement project. Proposals for high-speed rail service have been considered from the early 1960s onward. Special attention is given to the legislative history, the underlying research studies, and the experimental service program. The manner in which these factors, combined with the bankruptcy of private eastern railroads and other influences, fed into policy recommendations and the eventual policy decisions are then discussed. Special attention is given to the role of research and analysis as an influence on policy decisions.

THE CURRENT POLICY

In early 1976, the U.S. Congress enacted the Railroad Revitalization and Regulatory Reform (Four-R) Act of 1976. ¹ Title VII established the NEC improvement project and authorized funding of \$1.6 billion to the Secre-

tary of Transportation for improvements to the main corridor route. An additional \$150 million, requiring equal state and local matching funds, was provided for fencing and certain station improvements. Although under the management and supervision of the Department of Transportation (DOT), the actual acquisition of rail properties and equipment and the operation of passenger service was to be undertaken by the National Railroad Passenger Corporation, usually called Amtrak. Amtrak had been created by the Congress in 1970 as a quasi-private but government-sponsored corporation and is now responsible for most intercity passenger service in the U.S. Amtrak had not previously owned its own railroad rights-of-way nor employed engine crews.

Specific goals were set for the improvement project, most importantly the establishment of regularly scheduled and reliable service between Washington and New York with a trip time of two hours and forty minutes and between New York and Boston in three hours and forty minutes, both including intermediate stops. The system performance of proposed service is compared to present service in Table 1. Running time on the Washington-New York segment would be reduced a modest 14 percent relative to present premium service (Metroliners), but trips on both segments would be about one hour shorter than present conventional service.

Table 1 - System Performance

Proposed Service	Washington to New York	New York to Boston
Trip Time (5 Stops)	2:40	3:40
Lateness Allowance	5 Minutes	5 Minutes
On-Time Specifications	Over 95%	Over 95%
Present Premium Service a)		
Trip Time (5 Stops)	3:04	3:56 b)
Lateness Allowance	15 Minutes	15 Minutes
On-Time Performance	63%	66%
Present Conventional Service		
Trip Time	3:50 (6 Stops)	4:30 (5 stops)
Lateness Allowance	15 Minutes	15 Minutes
On-Time Performance	70-80%	70-80%

a) Metroliners/Turbotrains 1st Quarter 1975 Average.

b) No Turbotrain service now operated.

Source: U.S. Department of Transportation, Federal Railroad Administration; "Northeast Corridor Improvement Program, Briefing Notes", December 1976.

The improvements scheduled cover the full range of railroad rehabilitation and construction, but with emphasis on improvement of the existing facility with minimal right-of-way acquisition. Included are track and bridge repair and replacement, roadbed and drainage

repairs to tunnels, curve realignment, new or modernized electrification and signalling, grade-crossing elimination, new service facilities, and restored or upgraded stations. Track and bridge work comprise about one-half the total program cost.

The current program should not be viewed as a final policy determination, because the Four-R Act explicitly requires DOT to report to the Congress after two years on the feasibility, both engineering and financial, of further improving service to a two and one-half hour schedule for Washington-New York and a three hour schedule for New York-Boston. However, this faster service level was unsuccessfully proposed during consideration of the Four-R Act, so it could be difficult to get Congressional approval. In addition, annual appropriation of funds, unanticipated inflation, or other vagaries could influence whether the authorized program is in fact implemented over time.

BACKGROUND

In the early 1960s the increasing concentration of population in urbanized areas and the simultaneous shift from central city to suburb was nowhere more evident than in the NEC, the most densely populated region of the U.S. Rapid travel growth was creating highway and airport congestion at peak periods. The bankruptcy of the New Haven Railroad in 1961 caused special concern about intercity travel alternatives north of New York City. As early as 1962, a Public Authority to finance and operate NEC rail passenger service was proposed.² A Presidential Task Force was set up, and in 1963 Congress made a special appropriation of funds to officially establish the NEC Transportation Project. After preliminary study, a proposal was submitted and approved in the High-Speed Ground Transportation Act of 1965, with authorized funding of \$90 million.³ It was this legislation that supported the extensive research and analysis of intercity transportation in the corridor and that funded demonstration tests of high-speed rail passenger service over the next few years. These two efforts were the major substantive inputs for the eventual policy decision.

FINDINGS OF THE RESEARCH EFFORT

This section examines the research effort in two phases, first the analytical studies and then the experimental results from demonstration operations in the corridor.

The NEC Transportation Project Report

The research studies examining transportation alternatives in the Corridor resulted in a wide-ranging series of 17 reports describing the NEC transportation network, the analytical methodology employed, the various modal alternatives selected for study and the demand and cost analyses undertaken. These 17 reports were then summarized in a single Project Report which presented and compared nine broadly conceived, multimodal options.⁴

The Northeast Corridor project and accompanying reports in many ways represent an extensive applied experiment in econometric modelling and the model/simulation process in general. Many techniques were developed, refined and often discarded during this research. The term "modal split" and the concept of an "abstract mode", that is, a mode characterized by its service characteristics are examples of concepts closely associated with this project. The Secretary of Transportation in transmitting the Project Report to Congress said "this report breaks significant new ground in the field of comprehensive quantitative analysis of . . . complex long range transportation problems".

The Project Report presented options that were designed to be responsive to a wide range of policy directions, for example, external decisions about the desirability of private versus public investment or about institutional changes that might antedate the actual transportation decisions. In this sense, the research effort was

designed to be responsive to broad, unpredictable policy mandates, rather than the reverse. This later proved critical, since bankruptcies among the private railroad carriers in the region provided the impetus for dramatic institutional change and for previously unthinkable forms and levels of government support.

The problem in the Northeast Corridor was broadly identified as one of congested air facilities and congested highway facilities faced with growing demands. This congestion occurred mainly in the large metropolitan areas, but the NEC has several of our largest and oldest metropolitan areas on its route. Hence, the quality of intercity transportation depends not just on line-haul routes but on the ease of circulation through and within the large population centres. An important corollary is that intercity high-speed ground modes which have terminals in city centers will be most appropriate if cities concentrate on developing radial transportation networks, whereas the development of urban beltways and continued suburbanization has impinged upon decisions and suggests modes oriented towards the periphery.

The Options

The nine passenger transportation options presented in the Projects Report incorporated the existing auto, bus, air, and rail (including rail demonstration improvements) modes, and factored in five new modal possibilities in varying combinations. The four ground modes analyzed were:

- Demonstration Rail (DEMO -- 125 miles per hour top speed, approximately three hour trip time Washington to New York, and three and one-half hours New York to Boston.

- High-Speed Rail "A" (HSRA) -- 150 mph top speed, two and one half-hour trip time Washington to New York, and two and three-quarter hours New York to Boston.

- High-Speed Rail "C" (HSRC) -- 200 mph top speed and two hour or better trip times on both segments.

- Tracked Air Cushion Vehicle (TACV) -- 300 mph top speed and approximately one and one-half hour trip times on both segments.

In addition, two air modes were examined:

- Short Take-Off and Landing (STOL) Air -- 265 mph and multiple landing sites in the downtown areas as well as on the periphery.

- Vertical Take-Off and Landing (VTOL) Air -- 265 mph and multiple landing sites in the downtown areas as well as on the periphery.

The Project Report did not choose among the nine options; that is, no policy recommendation was made. However, a number of general conclusions can be drawn from the document. First, with the exception of DEMO rail, none of the improved ground modes proved commercially viable within 10 to 15 years of start-up and would thus require public support. Both of the new air modes showed ability to attract traffic and produced favorable financial projections (ability to earn a ten percent return on investment). The prime reasons were low access times due to dispersed terminals, their speed advantage on the longer trip stages, and lower immediate capital costs for ground improvements traded-off against higher annual operating costs in future years. Several points favorable to STOL were noted.

Gradations of Railroad Improvement

Because the DEMO rail option showed a positive net revenue impact whereas the higher level ground improvements did not, ten progressive second-order alternatives were examined for improved rail service ranging from the DEMO level to the HSRA alternative. In fact,

26 specific improvement projects were identified and grouped into these ten intermediate alternatives.⁵ The improvement projects showed wide variation in terms of both passenger minutes saved and minutes saved per thousand dollars of improvement costs. The range for passenger minutes saved per day per thousand dollars of improvement was from 10.6 for the most promising projects down to 0.1 on the low end. The highest benefits tended to occur south of New York, primarily because of higher patronage levels on that segment.

The maximum impact on net revenues would be realized by implementing only the first package of improvements (costing \$187 million) on the ten examined. This package included DEMO-type equipment (Metroliners) and a relatively small amount of additional right-of-way improvement. Benefits from further roadway improvements tended to be offset by increased costs, so that net revenues would fall as further improvement was undertaken. A middle-ground improvement package, requiring about half the added investment for HSRA, could achieve two and one-half hour times for Washington to New York (identical to HSRA) and three and one-quarter hours for New York to Boston. The remaining improvement north of New York to further reduce the New York to Boston running time would absorb all of the additional funds required to implement HSRA. These supplemental findings, tucked away in a technical appendix, appear to be quite influential in the next stage, the policy recommendations of the Secretary of Transportation.

Metroliner experience to date

Paralleling in time the analytical studies, an operational experiment was underway to implement interim rail improvements described above as DEMO rail. The evidence generated by the Metroliner demonstration should have provided a valuable input into the policy-making process, and the ridership and financial experience is examined in this section. The focus here is on the New York to Washington segment of the NEC, because only one train a day in each direction operated north of New York and because the Turbotrain service between New Haven and Boston has been very spotty and limited in nature. The level of existing ridership also suggests that it is more important to focus on the southern half of the NEC. Traffic on the southern segment totalled about 7.1 million passengers in 1975, whereas total New York to Boston traffic was only about 1.5 million and had fluctuated around that level since 1969. Looking first at overall passenger data for the New York to Washington route, as shown in Table 2, ridership on the Metroliner grew dramatically from its introduction in early 1969 through the end of 1972. Moderate growth continued in 1973 and 1974; part of each of these years reflect gasoline shortages triggered by the Arab oil embargo. The most recent two years, 1975 and 1976, show declines of 8 to 9 percent in Metroliner ridership.

Ridership on conventional trains being operated over the same segment declined in every year from 1969 to 1973 following the introduction of Metroliner service. In 1974 (and in the last months of 1973) conventional

Table 2 – Northeast Corridor Rail Passenger Traffic
(Thousands of Passengers)

Segment/Service	Year							
	1969	1970	1971	1972	1973	1974	1975	1976 a)
Washington to New York								
Metroliner	605	1,252	1,625	2,153	2,353	2,494	2,266	2,091
Conventional	6,881	5,507	4,848	4,499	4,492	5,067	4,797	4,858
Subtotal	7,486	6,759	6,473	6,652	6,845	7,561	7,062	6,949
New York to Boston b)	1,564	1,177	877	1,188	1,323	1,701	1,535	1,371
Total NEC	8,947	7,936	7,350	7,840	8,168	9,262	8,597	8,320

a) Estimated, figures preliminary and recording basis changed.

b) Includes Turbotrain riders.

Sources: U.S. Department of Transportation, Federal Railroad Administration, *Rail Passenger Statistics in the Northeast Corridor, 1974-1975*, March 1976.

ridership was reserved, primarily attributable to the gasoline shortages and possible the 55 mph highway speed limit, but declines continued in 1975. The resulting total rail ridership on the southern half of the Northeast Corridor has been remarkable unaffected by the Metroliner service. Prior to the demonstration, total ridership in 1968 was approximately 7.0 million passengers, and the level in 1975 represents only a small increase in passengers. The 1976 estimated totals are actually below 1968

levels. On this score, one can hardly say that the Metroliner demonstration has been an unmitigated success. Indeed, except for high patronage in 1974, few riders have been attracted to rail usage, since Metroliner patronage gains have been matched by declining conventional train ridership. It is only fair to point out that traffic had been declining throughout the 1960s. Also, the quality of conventional trains declined rather sharply in the early 1970s, and has only recently been upgraded by the in-

Table 3 – Estimated Air Passengers, Local Traffic Only, Both Directions, For Selected City-Pairs, 1970-1975,
(Thousands of Passengers) a)

	1970	1971	1972	1973	1974	1975
Washington to Philadelphia	123	103	117	114	100	22
Washington to New York	1,659	1,355	1,233	1,734	1,673	1,561
Baltimore to New York	245	213	235	202	192	168
New York to Boston	2,045	1,629	1,446	1,913	1,836	1,680

a) Based on 10 percent ticket sample.

Source: U.S. Civil Aeronautics Board, *Origin and Destination Survey of Airline Passenger Traffic, Domestic*, various years.

roduction of the new "Amfleet" equipment. The 1975 data may also reflect a fairly sharp fare increase by Amtrak.

High-speed rail service attempts to compete with the air mode, at least for the longer trip lengths, so selected city-pair data for local air passenger traffic are presented in Table 3 for comparison with the rail traffic experience. The data, based on a ten percent sample, show that the air mode has had very mixed results as well. The large Washington-New York market declined from 1970 to 1972, rose sharply in 1973, and has declined steadily since that time. The remaining city-pairs examined all show falling local ridership between 1973 and 1975. Thus, there is some indication that the NEC passenger market, at least for the high-speed modes, is shrinking overall. In this context, the rail performance looks better, but considerable doubt is created regarding the need for capacity expansion to meet projections of growing demand.

A look at rail city-pair data for sub-segments of this part of the NEC yields some interesting observations. As might be expected, conventional trains are much more popular for short trips where line-haul speed is less important. For example, ridership between New York and Philadelphia amounts to about 72% of the total conventional train ridership. Metroliner dominates for longer trips. Although total conventional passengers are more than twice those using the Metroliner, longer trips such

as between New York or Newark and Baltimore or Washington actually show more passengers on the Metroliner than on conventional trains. Further, the total rail market is substantial relative to air for the longer trips, more than double air for New York-Baltimore and over 60% for New York-Washington.⁶

Is High-Speed Service profitable?

There has been a persistent illusion of profitability for Northeast Corridor operations, and most non-professionals with whom the author has spoken believe that the Metroliner service has been financially successful. This belief appears to stem from a combination of factors including the continued increase in Metroliner ridership, the fact that the early years of the operation were under a demonstration project with costs partly borne by the Penn Central Railroad, and the original method of reporting expenses adopted by Amtrak which did not include many cost items assignable to Metroliner operations. Through 1973, Amtrak reported operating profits on the Northeast Corridor overall with the Metroliner showing quite favorably. A 1974 Department of Transport report pointed out the apparent understatement of operating costs by route. Where Amtrak had projected a NEC operating profit of \$6.1 million, DOT estimated a Northeast Corridor deficit of \$17.2 million.⁷

Table 4 – Selected Operating Results, By Fiscal Year

	Operating Income (Loss) a) Million of Dollars			Income (Loss) Per Revenue Passenger Mile, Cents ()		
	1974	1975	1976 b)	1974	1975	1976 b)
Northeast Corridor						
New York to Washington (Metroliner)	\$(3.6)	\$(4.8)	\$(13.8)	(1.0)	(1.4)	(4.3)
New York to Philadelphia (Conventional)	(9.0)	(32.6)	(20.0)	(5.6)	(6.1)	(11.7)
Boston to Washington (Conventional)	(18.4)	(13.1)	(42.8)	(3.2)	(8.1)	(7.5)
Total	(31.0)	(50.5)	(76.6)	(2.8)	(4.9)	(7.2)

a) Includes allocation of most common expenses, but most capital charges not included.

b) Estimated, series discontinued due to accounting change.

Source: National Railroad Passenger Corporation (Amtrak), "Five Year Corporate Plan", September 1976; same document, variously titled, August 1975 and August 1974.

Table 4 shows the annual operation income (loss) and income expressed in cents per revenue passenger mile (rpm) for three recent years. It is evident that the 1974 losses were underestimated by all parties, finally totaling \$31 million. However, the deficit solely attributable to Metroliner operations is quite small. When calculated in cents per rpm, the Metroliner service has required federal support of only about one cent per passenger mile, though results worsened considerably in 1976. It is important to note that this loss is very much lower than the overall loss of about 11 cents per rpm experienced on all other rail passenger routes by Amtrak. Clearly, no evidence of operating profits is indicated, but Metroliner service is much closer to that goal than any other rail passenger service in the U.S.

RECOMMENDATIONS -- THE NEXT STAGE TOWARD POLICY

The NEC Transportation Project Report of 1970 delineated options, but made no recommendations. As the analyses were refined, there were several important intervening developments. These included the bankruptcy of the Penn Central and passage of new federal legislation on airport and airway development, urban transit assistance, highway assistance, and environmental and

air quality standards. Urban and air transport received expanded assistance, at least in part to relieve congestion.

The 1971 recommendations

A new report, *Recommendations for Northeast Corridor Transportation*, was transmitted to the Congress in 1971.⁸ This report, often referred to as the recommendations of the Secretary of Transportation, reflected a number of policy decisions and refinements of analysis, some of which were in response to the intervening legislative developments. The 1971 report recommends the implementation of an Improved High-Speed Rail (IHSR) alternative for the NEC, achieving trip times of two and one-half hours for Washington-New York and three and one-quarter hours for New York-Boston. The initial investment required was estimated at \$460 million.

The recommended IHSR improvement is essentially the same as the middle-ground project mentioned earlier in the 1970 Project Report, a compromise between DEMO and HSRA. The Project Report had indicated that incremental net revenues would be generated by this improvement. Two noteworthy aspects of this recommendation were the scaled-down goals for the

near-term and the relative emphasis on improvements for the Washington-New York segment. Both reflect concern for positive, and high rather than low, financial returns to the capital improvements.

The 1971 report coupled the IHSR recommendation with a program of highway improvements and information systems aimed at reducing congestion experienced by traffic passing through intervening urban areas; this recognized the importance of access and door-to-door times suggested in the research. Serious questions were raised about STOL and VTOL, primarily because of environmental considerations and community opposition, but further research and development toward reducing environmental impacts was recommended. Recognizing the likelihood that improvements beyond IHSR would interfere with freight and commuter service, a plea was made for immediate planning of a new right-of-way along the NEC.

The 1973 recommendations

A new report was issued in 1973, in which basically the same IHSR system was recommended, but new cost estimates and more detailed operating projections were provided. Other modes and options were no longer mentioned. The new document began with an endorsement stronger than that of the NEC project group:

"The Department of Transportation proposes that the Northeast Corridor rail line be upgraded . . .".⁹

The proposed upgrading would achieve the same non-stop running times as IHSR. The resulting running time with stops for Washington-New York is the same two and one-half hours, but the New York-Boston time has been shaved to three hours, somewhat shorter than before. The new estimate of the initial investment cost is \$700 million, including rolling stock but not lease of right-of-way. The fixed-plant improvements are divided by segments of the NEC, showing \$285 million for New York-Boston versus only \$209 million for the heavily travelled Washington-New York segment.

Reorganization of Bankrupt Railroads

NEC passenger operations were being conducted over the rail properties of the Penn Central and its subsidiaries, though state governments had leased or acquired some right-of-way north of New York. Implementation of improved high-speed rail service was difficult because:

- Railroads had lost interest in passenger service and Amtrak was now responsible for contracting for most operations.

- Penn Central did not have sufficient cash flow to undertake improvements.

- The federal government was unwilling to finance capital improvements for privately-owned right-of-way, primarily because legal precedent suggested that such improvements became the property of the private owner.

The financial difficulties of the Penn Central and the other eastern bankrupts provided the impetus for legislation and an opportunity for change and progress on the Corridor. The Regional Rail Reorganization (Three-R) Act of 1973 provided the goal of "the establishment of improved high-speed rail passenger service, consonant with the recommendations of the Secretary in his report of September 1971, entitled *Recommendations for Northeast Corridor Transportation*".¹⁰ The Three-R Act established a new nonprofit government corporation, the U.S. Railway Association (USRA), responsible for planning the reorganization of the bankrupt eastern railroads. The USRA was originally given obligational authority of \$500 million which was intended for the NEC Improvement Project. USRA funds were also

provided for the reorganization and other purposes, and some controversy arose as to the amount of funding available for NEC passenger improvements.

The Three-R Act provided additional legislative instruction regarding NEC improvements. The Secretary of Transportation was instructed to begin the necessary engineering studies and improvements upon enactment. Property arrangements for transfers to Amtrak were discussed, with instructions that the properties should be improved at the earliest practicable date, and USRA was instructed to provide for the necessary coordination between NEC intercity services and freight or commuter services using the facilities. Also, the plan was to identify all short-to-medium distance corridors in densely populated areas where high-speed passenger operations would return substantial public benefits.

USRA Recommendations

In its reorganization plans submitted in 1975, USRA concurred in and made provision for the implementation of the 1971 recommendations, trip times of two and one-half hours for Washington-New York and three hours for New York-Boston.¹¹ After considering several options, full control of NEC passenger operations was vested in Amtrak.

The USRA recommendations were based in large part on the comprehensive economic and market analyses conducted within the DOT.¹² The trip times were regarded as adequate to achieve substantial ridership increases and to attract a larger share of the total corridor market. However, it was noted that, while revenues were expected to cover operating costs, there was no expectation that rail revenues would be sufficient to cover initial capital costs and/or amortization, so that direct financial support would be necessary.

USRA recommended that high-speed service be limited to the Northeast Corridor in the near future, although 16 other corridors were identified as potential candidates per the goals of the Three-R Act. USRA viewed its role as making certain that rail facilities required for passenger development were indeed available, and proposed a strategy different from that of Amtrak for passenger development outside the NEC. Specifically, USRA proposed that non-NEC expenditures not be concentrated on upgrading a limited route structure, because the major investment required to attract passengers was justified only in the NEC.

This conclusion was based on various DOT corridor studies and existing ridership patterns. The preliminary plan stated:

"In corridors other than the Northeast Corridor, benefit indices are so minimal by comparison that further analysis would be needed before implementation of high-speed service is undertaken".

Having concluded that costly public commitments for high-speed service in other corridors could not be justified, USRA proposed more gradual service improvements to observe whether demand materialized.

Facilities control issue. When facilities are used for more than one operation, desired improvements in curvature, signals, and track standards will vary significantly for high-speed passenger trains versus conventional freight and passenger trains. Further, maintenance must be reconciled. Freight use could deteriorate track structure and would present a higher probability of operating delays. In order to accommodate projected passenger traffic in ten to twenty years, complete separation of passenger and freight operations was suggested. Private sector ownership of NEC facilities was rejected because of the desirability of pursuing service objectives of high-speed operation and because of the potential burden on the reorganized freight carrier's capital structure.

Operating control issue. Operations control is important because of interference between trains causing delays. Priorities for train dispatching can have an important effect on service quality as well as operating expenses. USRA recommended operating control for the passenger operator to insure priority for passenger trains, allowing operations at maximum speeds. The transfer of passenger facilities and operations to an agency whose primary interest was passenger service improvement would recognize and hopefully alleviate the past conflicts between passenger and freight interests.

Financial responsibility issue. USRA recommended that the cost burden of passenger service be borne by the responsible passenger entity. The very low likelihood for profitable passenger operations was recognized, but there was a desire to have the full identifiable cost of passenger service out in the open to assist in more rational policy making. Cost-sharing principles were proposed wherever NEC passenger operations overlapped with freight or commuter service, attempting to reduce the possibilities for unintended cross-subsidy. It was hoped that an indifferent attitude toward either service could be avoided if costs were properly identified and allocated.

The 1975 recommendations

While USRA was planning the reorganization of bankrupt eastern railroads, the Department of Transportation was undertaking a multi-million dollar update of their NEC analysis, including extensive preliminary engineering which served to better delineate the individual improvement projects needed and their costs. Once more a report containing several policy options and a recommendation was prepared, but on this occasion the political nature of policy-making intruded and the report was not publically released nor officially transmitted to the Congress.¹³ The options considered in 1975 and the revised cost estimates have since become available and are presented in Table 5. They are very similar to previous options. Rough equivalents of the DEMO option are the low options D and E, except that the Washington-New York time of two hours and forty-five minutes is a better service standard (versus three hours) than previously employed. The high option A is similar to IHSR, formerly recommended in 1971 and 1973, though option A shows 15 minute better trip times for New York-Boston. Thus, the legend in Table 5 which compares each option to the DEMO program reflects somewhat higher standards relative to previous proposals.

The estimated costs escalated dramatically and now range from \$1.0 to \$3.3 billion. The higher cost estimates can be attributed to several influences including the higher standards, accumulated deferred maintenance, more detailed engineering, and some apparent "goldplating" of the projects. Even these higher costs do

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Table 5

OPTIONS CONSIDERED IN 1975 RECOMMENDATIONS					
Characteristic	Option A	Option B	Option C	Option D	Option E
Trip Time	2:30/3:00 hrs	2:50/3:50 hrs	2:30/3:30 hrs	2:45/3:30 hrs	3:00/4:00 hrs
Maximum Speed	150 mph	120 mph	North-120 mph	120 mph	105 mph
1990 Ridership (Modal Share)	30M (23%)	26M (20%)	South-150 mph	27M (21%)	17 (13%)
Cost			29 (22%)		
a) 1974 Constant \$	\$2.4B	\$1.8B	\$2.1B	\$1.8B	\$0.7B
b) Inflated \$ à 7%	\$3.3B	\$2.5B	\$2.9B	\$2.5B	\$1.0B
Distinguishing System Characteristic	<ul style="list-style-type: none"> • Remove Freight • Standards > Metroliner Demo Program 	<ul style="list-style-type: none"> • Freight Remains • Standards = Metroliner Demo Program • No Route Realignment 	<ul style="list-style-type: none"> • Remove Freight South Corridor Only • Metroliner Program -North = -South > 	<ul style="list-style-type: none"> • Freight Remains • Standards = Metroliner Demo Program • Land Purchased for Future Realignment • Route Realignment in South Corridor Only 	<ul style="list-style-type: none"> • Freight Remains • Standards < Metroliner Demo Program • Essentially accomplishes Deferred Maintenance

Source: U.S. Department of Transportation, Federal Railroad Administration, Northeast Corridor Improvement Program, "Briefing Outline", December 1976

not include equipment acquisition required for reliable, frequent service.

The unofficial recommendation in the report was for option D, a modest improvement over the original DEMO levels of service. The funds were to be provided as zero-interest loans, with state governments responsible for a 10 percent share. However, the Secretary of Transportation and the Ford Administration did not publically support this recommendation, but rather lobbied for a low spending option of about \$1.2 billion, just

above option E in Table 5. This reflected a publically stated disillusionment with rail passenger service, an attempt to hold down the level of Amtrak deficits, and a general low spending posture in a Presidential election year.

POLICY DETERMINATION

The scene now shifts to the legislative arena where a major package of rail legislation was taking shape. The NEC improvements were included as one component of

this package that also contained regulatory reforms, federal assistance for the reorganization and consolidation of bankrupt eastern railroads, and rehabilitation and improvement financing for solvent freight railroads nationwide.

Legislative Compromise

Enactment of legislation in the United States sets the overall framework for policy and often provides fairly specific duties and goals for the federal agencies involved. Such legislation invariably involves compromise in order to assemble majority approval and ensure legislative progress. There are two major areas where compromise surfaces publicly in the legislative process. The first is when distinctions or differences arise in the bicameral process between the House of Representatives and the Senate versions of a piece of legislation. The second is when differences arise between the legislation enacted by the Congress and the wishes of the President.

Major differences arose at both stages with regard to the Northeast Corridor legislation. It is impossible to ascertain whether these differences reflected a real divergence of policy or were a result of strategic positioning prior to a final compromise. For example, recognizing the necessity for a final compromise, one or both parties may strategically change their own position on an issue, broadening the middle ground and hoping to effect a compromise closer to their original desired outcome. Thus, the original positions taken are not definitive of policy desires, but are of general interest and usually determine a range which encompasses the final outcome.

The disparities between different positions on NEC policy appeared more extreme than usual. The Senate originally passed a bill (S. 2718) which stipulated improvements leading to the system originally recommended in the 1971 and 1973 reports from the Secretary of Transportation. That improvement would permit service from New York to Washington in two and one-half hours and from New York to Boston in three hours (with stops, faster non-stop service possible). The Senate bill provided \$3 billion for improvements, plus funds for takeover of the right-of-way and startup expenses. The House bill originally submitted (H.R. 10979) provided \$1.4 billion for Northeast Corridor improvements, but, under heavy pressure from the Ford Administration, the House bill as passed contained only \$900 million, less than the Administration seemed willing to settle for. This lower amount was said to be required simply to maintain existing levels of service and to increase reliability.

After a conference was held to reconcile the differences between the House and Senate versions, a bill was agreed to by both chambers that contained funding of \$2.4 billion for the Corridor in the form of loans plus some supplementary grants for the ownership and operating transition. However, the Administration indicated its intention to veto this bill because the total amount of funds for all rail programs was excessive and because the amount for the Northeast Corridor was unacceptable. In an unusual legislative maneuver, the bill that was agreed to by both chambers was not sent to the President for approval, as would normally be the case, but was referred back for a new conference.

The second conference, under heavy pressure from the Administration, reported a bill that provided \$1.6 billion for Northeast Corridor improvements and a service goal of two hours and forty minutes from Washington to New York and three hours and forty minutes from New York to Boston. Also included were the startup funds and funds for non-operational improvements to stations, the latter requiring state matching funds. These provisions became law in the Four-R Act.

This program for the NEC, this combination of money and service goals, was not one of the official options presented in the Secretary's recommendations of 1971 or 1973, nor can it be identified in the unofficial 1975 Secretary's report. It represents a complex mix of options B, C, and D from Table 5. NEC project personnel fortunately indicate that the funding should be sufficient to obtain the goals specified, although equipment financing will eventually be required. Thus, the decision which determined current policy was premised on the research results, but did not adopt directly any of the recommendations based on that research.

The decision revisited

As the legislative decision neared culmination, there was clearly little stress on empirical evidence and program justification. The weighing of improvement options receded, and running times over major segments came to serve as a proxy in a controversy over the level of budgetary commitment. The policy decision also became embroiled in election-year politics.

The Role of Research

The extensive analytical effort on NEC improvements was instrumental in shaping the eventual policy decision in a number of ways, even though it was not conclusive. Focusing one's perspective on the final days, the legislative process, tends to diminish the role of research. But if a more removed view is taken, the research appears more influential. The original proposal in the early 1960s envisioned very high-speed ground transportation, traversing the entire NEC in four hours or less. The studies and reports investigated this proposal and identified problems in the NEC across the overall passenger transport market. Extensive supporting detail was generated on the need for additional capacity and the costs and service benefits of meeting this need by various improvements in the air, highway, and rail network.

Of course, the results supported a number of actions which have not been implemented. The importance of improved access to terminals, both for its role in door-to-door trip time and in complementary amenities such as parking, has not been adequately reflected in policy decisions. The problems of Washington's Union Station and its conversion to a National Visitors Center are sufficient evidence of this failing. The potential for non-rail solutions such as STOL or improved conventional air has gradually been lost from sight. However, a substantial impact was made in several other decision areas.

Level of improvement. The studies and reports invariably concluded that the benefits of improvements south of New York were much higher because of the larger passenger market and somewhat lower investment costs relative to time saved. Truly, high-speed service northeast of New Haven appeared expensive, maybe even unobtainable on the present right-of-way through Providence along the shore. The policy mandate in the Four-R Act for a higher quality of service from Washington to New York reflects this finding; improvements for the New York to Boston segment are much less ambitious. An alternative route does exist inland via Hartford which appears to have a number of attractive characteristics. However, key political support came from the Rhode Island delegation, and this certainly influenced the route selection. At the other end of the spectrum of options, research showed the more ambitious proposals to be very costly relative to service benefits obtainable and projected revenues. Note the disappearance of the TACV and HSR options that were seriously considered at the outset.

Project selection. Project selection has another aspect, the number of projects to be undertaken. The Northeast

Corridor project represents just one of a large number of potential corridors for high-speed rail improvement. However, it was this specific corridor, its heavy concentrations of population, and its gradual encroachment upon remaining countryside, that inspired the interest in rejuvenated high-speed rail passenger service. This was the first "megopolis", but there are many other regional concentrations in the U.S. The Congress had this in mind in instructing USRA to identify other short-to-medium distance corridors for high-speed passenger operation. USRA did identify 16 additional corridors as candidates for new or improved service, but none had comparable characteristics to the Northeast Corridor. The lower NEC has major traffic submarkets in Newark, Trenton, Philadelphia, and Baltimore, and a high level of white collar business activity. Other corridors tend to be longer and without the major submarkets.

The underlying research substantially influenced USRA's failure to recommend improvement on other corridors and the final legislative outcome that directed only NEC improvement. The research appears critical for two reasons. First, Amtrak has continued to recommend upgrading and high-speed improvements on a number of corridors and in 1974 proposed expenditures of \$1.7 billion to upgrade 12 lines. Thus, agency support and a request for funding were in process. Second, focussing a national legislature on a specific project such as the NEC is very difficult indeed and often requires broadening the program to include a number of geographically distributed projects. That this did not happen suggests that the case for improvement on other corridors was simply too weak.

Economic viability. Research considers the economic viability of a proposed investment project for two quite distinct reasons. First, there is the market-test reason, that is, is the project worth undertaking, based on the users willingness to pay? Second, if the project is expected to be a commercial success, than an off-budget source of funding such as a loan or loan guarantee might be found such that direct financial support and appropriations would not be necessary. The legislative task of project approval is much easier in these cases.

Many projects offer promise of being commercially successful, and loan-type funding has been approved for a large number of projects in the U.S. in the past decade. Many have not been commercially successful, creating downstream financial demands on the federal government, for example, the need to liquidate loan guarantees when revenues prove insufficient. One important reason for the passage of the Congressional Budget Act of 1974 that established the Congressional Budget Office was to place constraints on the inappropriate use of this type of funding. Since research showed it unlikely that NEC capital improvements could be financed out of operating revenues, the policy decision was influenced to fund the projects directly.

Are political decisionmakers interested in economic viability? Apart from the differing legislative demands, essentially the need for appropriations, it is not the nature of political decisionmaking to subject every project to a viability test. Economic stimulus, job creation, income redistribution, and many other objectives are important in the policy-making arena. If all federal expenditures were financed by direct use charges, politicians would need a completely new vocabulary. The questions asked by research and those important to the policy decision may diverge on this issue, and, though progress has been made in quantifying non-economic project benefits such as land use, energy, or pollution, in the end it is the legislative process that we use to weigh those factors.

Preconditions for a NEC Decision

Two major preconditions cleared the way for a decisive policy regarding NEC improvements. Research had shown high-speed rail to have considerable, but not overwhelming, promise as a transportation solution for the Corridor, but there were institutional and legislative difficulties impeding further action.

Railroad reorganization. The NEC right-of-way was the property of the Penn Central, a private corporation, and serves as a major freight route south of New York. Passenger improvements were not attractive as a private venture. The institutional and political difficulties of infusing government funds into right-of-way improvements and of coordinating passenger and freight movements seemed insuperable. Little progress had been made since the agreements regarding the Metroliner demonstration in the late 1960s, prior to bankruptcy that further complicated matters. The decision to undertake a government-supported reorganization embodied in the Three-R Act was critical. It created the opportunity to both transfer the right-of-way to a passenger operator and provide for the movement of freight.

The legislative vehicle. NEC improvement was directly supported in the Three-R Act, but still little progress was made. The need for new legislation to complete the reorganization process led to the Four-R Act. That Act served as a legislative vehicle for several rail proposals not directly linked to the reorganization process, including regulatory reform and nationwide assistance for rail rehabilitation. Although all of these proposals had certain merit, it is unlikely that the individual components could have won Congressional approval. This is particularly true of the NEC project, as its benefits were confined to a relatively small though populous region. As a package, a much broader base of support was created.

CONCLUSIONS

Provision of high-speed rail service in the Northeast Corridor is now in the formative stages of implementation. Extensive analysis of the project has been performed over a period of almost 15 years. From an overall perspective, this analysis provided sufficient justification to kindle interest and support. The recommended level and emphasis of the improvements were clearly influenced by the research findings.

From a perspective closer to the actual legislative decisionmaking, the impact of research recedes and other factors predominate. Institutional rigidities had to be overcome as a precondition to implementation, and railroad reorganization became an almost necessary ingredient of the policy. Several policy issues fortuitously coalesced into a viable legislative package.

The policy currently being implemented is not one recommended by the underlying analysis, but it is not far removed from several options brought forward. Budget issues and legislative compromise have intruded, but a positive step has been taken in the recommended direction. This step will hopefully provide meaningful experimentation with the potentials of the Northeast Corridor. Many problem areas such as terminal access and labor practices were not successfully addressed. Of course, the current policy is not immutable. Improvement targets could be reduced by budget exigencies or upgraded by favorable experience, but that much is true of any program.

FOOTNOTES

1. Public Law 94-210, approved February 5, 1976, 45 USC 801.
2. Senate Joint Resolution 194, introduced June 1, 1962, by Senator Claiborne Pell. His book, *Megopolis Unbound: The Supercity and the Transportation of Tomorrow* (Praeger, 1966),

contains an interesting history of the NEC project.

3. Public Law 89-220, approved September 30, 1965, 49 USC 1631, subsequently amended in 1968, 1970, and 1972 to extend the Act and provide additional funds.

4. U.S. Department of Transportation, Office of High-Speed Ground Transportation, **Northeast Corridor Transportation Project Report**, April 1970 (NECTP Report No. 209).

5. *Ibid.*, Technical Appendix 5.

6. U.S. Department of Transportation, Federal Railroad Administration, **Rail Passenger Statistics in the Northeast Corridor, 1974-1975**, March 1976.

7. U.S. Department of Transportation, Federal Railroad Administration **Report to the Congress on the Rail Passenger Service Act**, July 1974.

8. U.S. Department of Transportation, Assistant Secretary for Policy and International Affairs, **Recommendations for Northeast Corridor Transportation, Final Report**, September 1971, three volumes. The Secretary's letter of transmittal clearly attributes the recommendations not to himself but to the NEC Transportation Project and indicates that they "are not to be construed as legislative proposals on the part of the Administration".

9. U.S. Department of Transportation, **Improved High-Speed Rail for the Northeast Corridor**, January 1973. The absence of a letter of transmittal from the Secretary to the Congress is an unusual feature of this document.

10. Section 206 (a) (3), Public Law 93-236, approved January 2, 1974, 45 USC 701 *et. seq.*

11. U.S. Railway Association, **Preliminary System Plan**, February 1975, 2 volumes; and **Final System Plan**, July 1975, 2 volumes. The plan is summarized in **Railroad Reorganization: Congressional Action and Federal Expenditures Related to the Final System Plan of the U.S. Railway Association**, Congressional Budget Office, January 1976.

12. DOT also influenced the selection of Amtrak as the operator and drew back somewhat from the NEC improvements by insisting on an incremental phasing of improvements which, after restoring the NEC to 1969 DEMO service standards, would implement other phases only "if desirable".

13. U.S. Department of Transportation, **"Recommendations for Rail Passenger Service Improvement to the Northeast Corridor"**, September 1975, unpublished.