

NETWORK NORTHEAST

**A Concept Plan for
High Speed Rail in the Northeast Corridor States**

prepared by

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FOREWORD

The creation of the Ozone Transport Commission through the 1990 Clean Air Act Amendments (CAAA) underscores the fact that much of the Northeast suffers from bad ozone pollution. Ozone, formed by volatile organic compounds (VOCs) and nitrogen oxides (NO_x), is a regional pollutant. Since the transportation sector produces perhaps half of the VOCs and NO_x in much of this region, the CAAA behooves us to look at ways to reform our transportation system so that we can enjoy good air, with its enormous attendant benefits for public health, our forests, our waters and visibility. While technological improvements in engine designs, emission control systems and fuels should make a significant contribution to reducing VOCs and NO_x and therefore ozone formation, the region, and certainly its major metropolitan areas, will not come into attainment with the national ozone air quality standard by 2007 if the amount of driving in the region, as measured by vehicular miles traveled (VMTs) and the total number of driving trips continue to increase at recent rates of two to three percent or more per year. Indeed, we must be prepared to look seriously at ways to reduce, not simply slow the increase in, VMTs and number of car and truck trips.

Much needs to be done at the metropolitan area scale in terms of improving transit, introducing road user fees, protecting open space, discouraging sprawl and fostering public and private investments in centers. New Jersey is beginning to move in this direction with the adoption in June of 1992 of its State Plan for Development and Redevelopment. However, dramatic improvements in inter-city rail within the Northeast could also make a valuable contribution to reducing the amount of driving by both cars and trucks. Ideally, investments to upgrade inter-city rail could serve both passengers and freight.

This report prepared for the Environmental Defense Fund by George Haikalis describes what a major Northeast inter-city rail improvement program could look like. Certainly, the improvements in service on the Northeast Corridor between New York and Washington and New York and Albany have shown that there is a significant market for inter-city rail with a rail service that is comfortable, convenient and fast, i.e., can compete reasonably well against either driving or flying. Further upgrading of service even in these corridors will attract more customers and provide for improved freight rail service. If we could envision average speeds of 80 (the report's short term plan) to 100-120 (the report's long-term plan) miles per hour, trains connecting many major cities in the Northeast, using existing lines, could provide reasonably rapid and attractive service. Since railroad stations, for historic reasons, have typically been well sited in the middle of downtown areas in urban centers, major investments in this inter-city rail system could help strengthen urban cores and be a focus for significant public and private investment. If such transportation investments were done in conjunction with zoning changes and other kinds of economic revitalization programs, we could envision significant high density residential, commercial and business developments in these cores. This in turn

could cut down on further dispersal of households and businesses and help preserve open space. For example, high speed rail service from New York to Albany and Buffalo could help stimulate urban revitalization in many of the major cities of the Empire State, not only New York City and Albany, but also Schenectady, Utica, Syracuse, Rochester and Buffalo.

This inter-city rail revitalization program would provide the Northeast with a major third transportation option for moving people and goods around, in addition to road and air travel. Given the congestion of so many of our roads and airports, the provision of such a viable option would be highly beneficial. Rail technologies are becoming available that can also make inter-city rail travel exciting. In addition, many of the existing inter-city rail lines in the Northeast offer spectacular views of rivers, coastal areas, forests, farmlands, hills and mountains and cities, towns and villages. Travel by air and expressway has almost obliterated these scenic experiences.

For these reasons, EDF has asked George Haikalis to prepare a report that looks at both short-term and longer-term opportunities to upgrade passenger and freight inter-city rail service in the Northeast. We recognize that billions of dollars of public and private investment are involved. But the benefits for the economic vitality and environmental health of the region would be enormous.

EXECUTIVE SUMMARY

The Northeast Corridor (NEC), the nation's most densely populated urban region, is home to some 44 million persons. The NEC also hosts the nation's second most severe air pollution problem, with ozone levels exceeding U.S. health standards. As much as 50% of this pollution problem is due to motor vehicle emissions. Recent Federal Clean Air legislation requires the NEC states to work together to solve this problem.

The NEC states' dependence on motor vehicle transportation has produced chronic, and steadily worsening traffic congestion, while encouraging low density development across critical open lands and away from established central cities. The cost of this car and truck-centered transport system is born by the public at large in the form of accidents, noise and the loss of social structure in urban life.

The key to reducing motor vehicle travel in the NEC is to make better use of the region's intercity rail system, a sleeping giant of an asset. The short term plan described in this report shows how the NEC states and the Federal government can take the railway network, coupled with complementary improvements to regional rail and local bus systems, and in four years, radically transform the NEC states' public transportation systems. A 4,500 mile high speed (125mph) rail network, developed from existing rail lines, including some now out of service, is a key feature of the short range plan. A fleet of tilt body turbine or diesel-powered trains would greatly improve running times on these routes which lack electrification.

The plan also calls for the NEC states and the Federal government to take positive steps to shift freight movements away from the region's deteriorating highways, and onto the underutilized rail freight system. New intermodal technologies are an important element in this shift.

In the longer term NEC states can add new very high speed (150mph or more) rail links making this network even more useful. The existing NEC mainline can be upgraded for higher speed in many locations. Mag lev remains a long term possibility, and several locations in the NEC are possibilities for a test track. However, advanced technology systems should not be used to hold off improvements on existing rail systems. There are opportunities in the cores of several large NEC cities to meld together separate terminals and through-route high speed trains, helping commuters and intercity travelers.

Needed is a regional, multi-state approach to plan and carry out the capital investments and operating strategies that would produce a NETWORK NORTHEAST -- an integrated, rail-centered transportation system.

I. INTRODUCTION

A continuous strip of urban development along the Atlantic Seaboard forms what has come to be known as the "Northeast Corridor (NEC)". The NEC is a 500 mile long chain of contiguous metropolitan areas, stretching from the Virginia suburbs of Washington, DC. to Portland, Maine. While no official definition of the NEC exists, for the purpose of this study 22 metro areas shown in Figure 1 and listed in Table 1 were selected. The NEC constitutes a substantial portion of 12 states plus the District of Columbia. It houses 17% of U.S. population and is the focus of the national government and international business.

A very elaborate highway and rail system serves this densely populated area. Over a decade ago the Federal government made a substantial investment in rehabilitating the NEC's main Boston-Washington rail route, particularly the New York-Washington segment, which is the nation's only "high speed" (125mph or more) rail line. Extensive rapid transit and commuter rail systems exist in the NEC and many are being upgraded and extended. Yet, the NEC's dominant transport mode is the motor vehicle. Auto registrations and vehicle-miles of travel in the NEC have grown substantially over the last several decades, while public transportation use has remained stable or declined. And emissions from motor vehicles make up a large share of the pollutants that keep most of the NEC in substantial violation of Clean Air Act ozone standards. Because this problem is so widespread and polluted air travels easily from state to state, the Clean Air Act Amendments of 1990 (CAAA) called for the establishment of an interstate Ozone Transport Commission (OTC). The cluster of states participating in this commission is shown in Figure 1 and listed in Table 2. OTC must assess the problem and help the states recommend measures to achieve clean air standards.

Public Gains by Upgrading NEC Rail Network

Upgrading high speed rail lines, and their connecting local public transport systems, and improving rail freight service in the NEC could lead to many worthwhile public gains. Encouraging a significant shift in metropolitan and intercity auto and truck traffic and short haul air travel to rail, and making better use of the rich resource of existing, but underutilized, rail trackage in the corridor states would:

- o cut emissions that result in ozone problems
- o reduce dependence on imported oil
- o focus new economic development in older cities
- o lower the pressure to develop open lands
- o avoid costly and disruptive highway expansion
- o set aside plans for noisy, unwanted new airports
- o reduce motor vehicle accidents

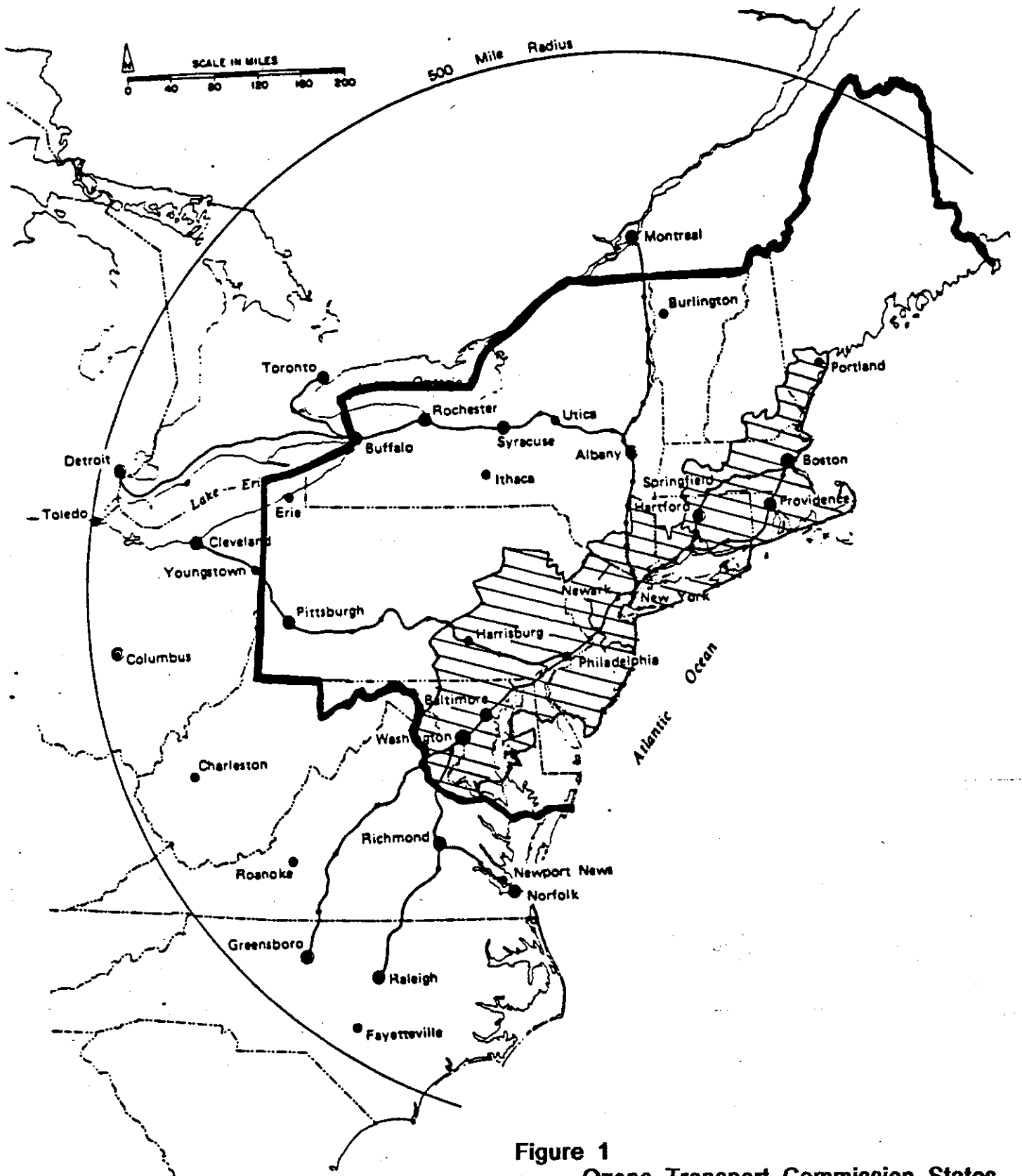


Figure 1
— Ozone Transport Commission States
▨ Northeast Corridor

Table 1 - Northeast Corridor

Metro Area	1990 population
Washington, DC	3,924,000
Baltimore, MD	2,382,000
York, PA	418,000
Harrisburg, PA	588,000
Pottsville, PA*	153,000
Allentown, PA	687,000
Scranton, PA	734,000
Reading, PA	337,000
Lancaster, PA	423,000
Philadelphia, PA	5,899,000
Atlantic City, NJ	319,000
Tri-State (NY/NJ/CT)	19,016,000
New London, CT	255,000
Putnam, CT*	102,000
Hartford, CT	1,124,000
Springfield, MA	603,000
Worcester, MA	710,000
Providence, RI	916,000
Newport, RI*	87,000
New Bedford, MA	506,000
Hyannis, MA	187,000
Boston, MA	3,784,000
Manchester, NH	336,000
Portsmouth, NH	350,000
Biddeford, ME*	165,000
Portland, ME	243,000
Total	<u>44,248,000</u>
Total U.S.	248,710,000

*county population, not defined as metro area by U.S. Census

Table 2 - Northeast Ozone Transport States

State	1990 Population
Virginia**	1,313,000
District of Columbia	607,000
Maryland	4,781,000
Delaware	666,000
Pennsylvania	11,882,000
New Jersey	7,730,000
New York	17,990,000
Connecticut	3,287,000
Rhode Island	1,003,000
Massachusetts	6,016,000
Vermont	563,000
New Hampshire	1,109,000
Maine	1,228,000
Total	<u>58,175,000</u>

**population is for VA suburbs of Wash.,DC metro area
the only portion of Virginia in OTC area
total VA population is 6,187,000

- o lessen the economic drain caused by auto-dependence
- o provide mobility for people who choose not to drive

This report provides a quick overview of the existing NEC rail services and major improvement plans that are now being considered. Key planning policies are identified and a NETWORK NORTHEAST concept plan for making vastly better use of the NEC's rail network is described. The plan includes short range (four year) proposals, and more capital intensive possibilities that can be put into place over the longer term (15 to 20 years).

II. CURRENT STATUS AND PLANS FOR RAIL SERVICE IN THE NEC STATES

Amtrak has operated "high speed" rail passenger service on the Boston-Washington corridor since the Federal agency was created in 1971. Amtrak took over money-losing rail passenger service from the nation's privately-owned railroads in order to allow these companies to survive as profitable freight carriers. The Federal government purchased the NEC line, including feeder branches to Harrisburg, PA and Springfield, MA, from the estate of the bankrupt Penn-Central Railroad as part of a plan establishing a merged Conrail freight system in 1976. Conrail absorbed most of the smaller carriers and became the dominant rail freight operator in the Northeast.

NEC Line

The Federal government invested over \$2.5 billion in the NEC line since 1971. Track, signalling and stations were renewed and structures were repaired. While the program did not produce major changes in top speed or frequency, it did restore service reliability. Last fall Amtrak operated seventeen weekday premium fare Metroliner services each way between New York and Washington with an average running time of two hours and fifty six minutes. This was 77 miles per hour for the 225 mile trip. The fastest express Metroliner took two hours and thirty five minutes or 87 mph. Amtrak also operated slower, lower-priced conventional trains on hourly headways on this portion of the corridor. No reservations are required for these trains. During holiday periods, extra cars (and extra trains) are added to accommodate overflow crowds.

Nine trains, each way, traveling the sinuous 232 mile Boston-New York run took an average of four hours and thirty nine minutes or 50 mph. The fastest express run took three hours and fifty nine minutes or 58 mph. Not including these express trains, the average speed on the New York-Boston run was a leisurely 47 mph. Electrification is in place from Washington to New Haven, where an engine change is required. Current plans call for a \$1.3 billion program of improvements including extending electrification on the 156 mile New Haven-Boston "Shoreline" route via Providence, purchasing new "tilt body"

trains that can negotiate the many curves on the Boston run at higher speed, and making other improvements. Envisioned is an hourly, premium fare Boston-New York Metroliner operation with a three hour running time. Only the initial down payment for the estimated \$300 million electrification extension has been funded by the Federal government, thus far. The Federal Railroad Administration (FRA) is carrying out an environmental impact analysis for the electrification, and Amtrak has awarded a contract to begin final design.

Other High Speed Rail Planning Studies in the NEC States

Last year New York State (NYS) and FRA launched several planning studies to consider new investment in high speed ground transportation for routes serving the NEC states. The most advanced is a study of the New York-Albany-Buffalo "Empire Corridor". This million dollar study, financed entirely by NYS, is exploring super speed "mag lev" trains as well as incremental improvements to the existing Amtrak service. A key study option is the use of the NYS Thruway right-of-way for an elevated mag lev structure. The second planning study is a half-million dollar FRA-funded New York-Massachusetts effort to explore a branch of the NYS line along the Massachusetts Turnpike to Boston. The third planning effort is an FRA-funded Maryland-led study of a Washington-Baltimore mag lev line. Congress earmarked funds for these studies as part its 1991 surface transport act, which also authorizes \$600 million for mag-lev research and to underwrite a short 19-mile demonstration line. Under another provision of this act FRA selected five additional high speed rail corridors for incremental planning studies focusing on grade crossing elimination. One of these, the Washington-Richmond-Raleigh-Charlotte corridor, reaches the NEC states.

Rail Freight Developments

When the Federal government established Conrail, it attempted to add a second major freight carrier to serve the Northeast. This effort failed, and in order to provide some minimum competition, the Federal government gave a weak regional carrier, the Delaware and Hudson Railway, extensive trackage rights in the NEC. Recently, the much larger Canadian Pacific Railway purchased this failing carrier, increasing rail freight competition in the NEC states.

Conrail and its predecessor Penn-Central greatly changed rail freight patterns in the NEC. The carrier shifted Boston-Washington rail freight operations inland via the Selkirk Yard near Albany. It ceased operations across the Hudson River in the New York metropolitan area, abandoning the Poughkeepsie rail freight bridge and its once extensive car float network in New York harbor leaving only a single local carrier, the New York Cross Harbor line. Freight cars destined for New York City, Long

Island, Westchester and Connecticut must follow a circuitous route through Albany. Not surprisingly, truck traffic dominates freight movements in this sector.

The CSX rail freight system reaches the southern portion of the NEC with its own line from Washington to Philadelphia. Conrail has taken advantage of its trackage rights over this line, and has shifted much of its traffic off the parallel Amtrak line. This has improved the reliability of Amtrak passenger service and reduced maintenance cost. Norfolk Southern (NS), the third major carrier in the Eastern part of the U.S., reaches only the corners of the NEC states. NS service is available at Buffalo and Washington and also to the Hagerstown, MD gateway.

These carriers operate intermodal (piggyback) service connecting NEC terminals with points in the Midwest and on to the Pacific Coast. Fast, scheduled trailer-on-flat-car (TOFC) trains, loaded at NEC terminals, carry vans of mail and packages consolidated by private firms or the U.S. Postal Service.

Conrail also handles overseas containers, unloaded at Pacific Coast ports and bound for NEC points, on transcontinental "double-stack" trains. It also moves a much smaller volume of westbound double-stack overseas containers to more distant, inland cities, unloaded from ships at Port Newark. At present, Newark is the only port in the NEC that can be reached by double-stacks, though Pennsylvania and Massachusetts will soon make funds available to improve rail clearances to Philadelphia, Baltimore and Boston. Conrail, along with other carriers, is beginning to convert some of its conventional domestic piggyback service to double-stack. TOFC traffic moves by rail only for very long distances and Conrail carries little if any intra-NEC traffic. Double-stack terminals are costly and infrequently spaced, increasing the length of highway movement to reach railheads in the NEC.

In addition to conventional piggyback service, NS operates bi-modal trains, using trucks fitted with steel wheels, called "road-railers". This service, based in the Midwest and the South, initially reached the NEC states at Buffalo and Alexandria, VA. Recently, NS established a joint venture with Conrail to extend its road-railer service to Newark and other NEC points. Amtrak is also testing road-railers to carry mail on its long-distance trains. A decade ago one private shipping firm expressed some interest in using road-railers through the Penn Station tunnels, the NEC's only railroad crossing of the Hudson River south of Albany.

A number of short line and regional carriers also operate in the NEC states. Major carriers created many of these in the deregulation era to continue branch line service at lower cost.

The other large Canadian carrier, Canadian National (CN), also has a modest presence in the NEC.

Commuter Rail Services

Eight distinct commuter rail operations use Amtrak's NEC trackage. Amtrak, itself, operates four of these services under contract to local authorities. These include the Massachusetts Bay Transportation Authority (MBTA) lines, ConnDOT's Old Saybrook-New Haven service, Maryland DOT's Washington and Baltimore-based routes and the newly formed Virginia Railway Express connecting Virginia suburbs with Washington. Four major independent commuter rail carriers interface with Amtrak. Metro-North Commuter Railroad hosts Amtrak operations on its Hudson and New Haven lines. The Long Island Railroad, New Jersey Transit and the Philadelphia-based Southeastern Pennsylvania Transportation Authority (SEPTA) operate over segments of Amtrak trackage. Rhode Island and Delaware contract with MBTA and SEPTA, respectively, to extend selected commuter runs across their borders.

Though all trackage is standard gauge, each commuter rail operator selects unique equipment designs, service guidelines and fare structures. Very little coordination takes place. Only a few joint fares are offered. When the Federal government purchased the NEC line it established a council of local commuter rail authorities to negotiate disputes. While the council remains in existence, it is not active in advancing coordination among the authorities.

Urban Rail and Bus Transit Systems

Local rail transit systems serve the NEC's five largest metro areas. By far the most extensive of these is the New York City subway system. Three smaller rail transit operations -- PATH, Staten Island Rapid Transit and the Newark City Subway serve the New York area as well. Boston, Philadelphia and Baltimore each have rapid transit and light rail systems and Washington has an expanding subway system. Philadelphia-based Delaware River Port Authority also runs a separate rail link to the New Jersey suburbs, which in turn connects with a discrete NJ Transit commuter rail service operated to Atlantic City. Fare integration between commuter rail and local transit systems does not exist to any significant degree, except in Boston and Philadelphia, where monthly or weekly commuter rail passes are honored on local transit systems. In most other cases connecting between NEC transit systems requires payment of multiple fares. Amtrak stations are located at important urban activity nodes in most NEC cities and serve as intermodal terminals.

Local and express bus service is operated in virtually every urbanized area in the NEC. Many of the larger metro areas that

have rail service offer some degree of coordination between bus and rail in terms of scheduling and fares. In the largest metro area centered on New York City, virtually no fare integration exists. In smaller cities, local bus services focus on the local business center. Travel between adjoining metro areas, by local bus, is a daunting challenge.

Two other metropolitan areas in the NEC states, Pittsburgh and Buffalo, also operate light rail transit systems.

Intercity and Rural Bus Systems

The era of deregulation in the 1980s included the intercity bus industry. Rather than bring about a renewal of the industry, however, deregulation contributed to its further decline. While charter bus business did benefit, few new private operators chose to get into the regular-route business. Instead, existing operators were able to drop money losing service to smaller communities. The largest firms, Greyhound and Trailways, merged and went through a painful strike that led to bankruptcy. Nationwide, only skeletal privately run intercity bus service remains. In the NEC states this is also the case, except for several New York City and Boston-based carriers which connect these cities to many communities that lack good rail service. Intermodal terminals for intercity bus and Amtrak exist in a few locations, such as Newark's Penn Station and several others are planned. However, few services are coordinated and joint fares are rare.

State and Federal programs provide some modest financial assistance for public transit services to small towns and rural areas. These programs were enhanced under the new Federal transport legislation.

Planning for the NEC

Planning for local and intercity public transportation and rail freight in the NEC involves a complex array of agencies. The new Federal transport act gives Metropolitan Planning Organizations (MPOs) a central role in allocating funds. The act requires MPOs to produce long range land use/transportation plans and short-term systems plans for managing traffic congestion, public transportation operations and intermodal facilities and services. Statewide plans are also required under the new act although not necessarily for intercity rail freight and passenger services. In the past, states prepared rail freight plans as a condition to obtain Federal funds to preserve lightly used lines. Most NEC states and MPOs do not have updated plans and must greatly strengthen their planning capabilities if they are to perform the role defined in the act.

Coordination of planning between adjacent states and MPOs is also required in the act although the steps to achieve this are not spelled out. At the MPO level, some coordination exists. However, MPO coordination within a single state is often dominated by powerful state highway building agencies that have little interest in advancing public transit or rail freight proposals. Interstate planning compacts are in place for MPOs in the Washington and Philadelphia areas. In the NY/NJ/CT metro area, 10 MPOs now handle the planning function once carried out by the now dissolved Tri-State Regional Planning Commission. Until the Ozone Transport Commission was established no formal cooperative mechanism existed, though state officials met in informal associations. Recently, New York state joined the Midwest/Northeast High Speed Rail Compact, which includes Pennsylvania and five midwestern states. Other states are considering joining this compact, which the states initiated to foster multi-state planning for high speed rail in the absence of Federal leadership. The Clinton Administration is proposing new legislation, with substantial funding, that would encourage states to advance high speed rail corridors.

Amtrak established an internal corporate planning process aimed at achieving revenue self-sufficiency by the turn of the century. This goal, which has been set back by the recent downturn in the economy, is based on substantial new capital investment by the Federal government, which has not been forthcoming to date. Amtrak's corporate strategy necessarily focuses on survival not major new initiatives. In 1996, Amtrak's 25 year right to operate on the host private freight railways expires and must be renewed. These carriers are not anxious to see a major expansion of passenger service on their lines. Recent experience in California and Florida, where new commuter rail operations were begun, suggests that the freight railroads may expect substantial sums for renewal of Amtrak trackage rights if major expansion in service or performance is planned. While this renewal does not apply to the Boston-Washington NEC line itself, most other existing and potential high speed rail corridors serving the NEC states would be affected.

A number of private, for profit, high speed rail projects have been proposed in the past decade. Several states awarded franchises to private firms who hoped to construct and operate these projects relying only on farebox revenues. None were built and only one, in Texas, remains active though it may require state subsidies. Still, many mag lev and high speed rail advocates continue to place high hopes on private initiatives. Without a major shift away from the current public policy of substantial subsidy to the air and highway modes this seems unlikely.

The private freight railways are responsible for their individual corporate strategies. Under deregulation only captive

shipments remain subject to Interstate Commerce Commission (ICC) control. The railroads are free to negotiate prices at will for freight movements where trucks dominate. While this new flexibility allowed railroads to drop unproductive lines and to focus on larger shippers it also led to closing of many marginal industries in the face of higher freight rates. Over the last 30 year much consolidation has occurred and only seven major companies dominate the industry, three in the East and four in the West. Mergers require ICC approval though no major national policy exists on shaping future consolidations.

III. KEY PLANNING PRINCIPLES

Major public benefits can be expected from a shift of local and intercity auto travel to the public transportation system in the NEC, a diversion of short haul air travel to NEC high speed trains, and relocation of heavy truck freight into rail cars or intermodal trains on rail lines. However, this cannot occur without a major change in transport policy. Following are several proposed policy elements that can lead to more effective transport planning in the NEC.

Set price and service levels to attract car and air travelers

All public transport operators in the corridor, local and intercity, face severe fiscal constraints. Without a clear mandate to encourage car and air travelers to shift to public transport, and without the resources to carry out this mandate, Amtrak and NEC transit agencies can only raise fares and cut service. While this may narrow the gap between revenues and expenses in the short term it leads to further decline in use. High fares can only be sustained for travel to downtowns in a few of the largest NEC cities where parking costs are high. When competing with auto and air trips in other travel markets high fares and poor service levels become major deterrents to use.

Use some portion of road pricing to benefit transit

Packaging road pricing with improved public transit is a concept beginning to gain favor. The new Federal transport law allows states and local governments to use funds raised from motor fuel taxes to advance public transit proposals. A recent study (Reference 1) suggests that current levels of motor vehicle taxation fall far short of covering direct and indirect public costs associated with the highway transport system and that a substantial public subsidy to motorists and truckers exists. Raising road use fees to recoup this subsidy is more readily achieved if some portion of the revenues produced go to improving travel alternatives. This applies to NEC intercity travel as well as local travel. A seamless network of fast, frequent and attractively priced regional and intercity rail and bus services, can make a dent in excessive NEC road and airport use.

Facilitate inter-agency cooperation

In the NEC each public transit carrier or jurisdiction seeks to optimize its own situation. Boundaries between carriers become revenue sources, even as they inhibit travelers who must transfer. Needed is a mechanism to encourage agencies to cooperate. A new revenue stream from road pricing could provide the incentive to glue the pieces together.

Coordinate services

Transfers and poor connections deter public transit use. Through-routed commuter rail services and coordinated cross-platform transfers between commuter rail and Amtrak high speed service would ease the effort and uncertainty involved. Systemwide information services and consolidated time tables would help travelers navigate the multiple entities involved.

Select practical, but advanced technology

Tilt body gas turbine-powered trains were pioneered on the NEC nearly thirty years ago, but rail operators are reluctant to adapt new ways and this technology languished. In the current political climate innovators in the public sector are rarely rewarded, and risk-taking is strongly discouraged, holding back progress. On the other hand, revolutionary technologies like mag lev need to be tested in the laboratory and not used as an excuse to postpone investment in existing, but advanced rail systems. New, more open approaches to research and development in the rail industry would help, and defense industries in the NEC states could be urged to refocus their abilities toward advancing ground transport technology.

Shift freight to rail while adding new passenger services

Existing privately-owned freight lines are a critical resource for adding new high speed intercity and commuter rail services. Until recently these lines strongly resisted new operations which might interfere with their profitable freight services. Now the Association of American Railroads (AAR) has a policy that welcomes their use for high speed passenger service, provided that adequate compensation is made available. Making efficient use of this policy requires a broader examination of all elements of the freight and passenger networks. Pooling of services and trading trackage rights could allow designation of some routes primarily as freight lines and others for passenger services. States can provide new incentives, like higher road user charges for trucks and more favorable tax treatment for railroads, to encourage this to happen. Federal initiatives are also necessary since concerns, and solutions, are interstate in scope.

Relate new transit investment to land use goals

The free-wheeling land use patterns generated by the auto-dominated transportation system have had a painful price. Precious open lands have been lost, and the cores of older cities have been allowed to decay. New investment in regional and high speed rail can be tailored to support desired land use patterns. Additions to the high speed network can focus on existing transit hubs and downtowns, not foster new ones in outlying locations. New long haul commuter and intercity train routes can make existing auto-centered suburban developments more transit-friendly and not create just more outward sprawl. Station locations can be oriented around feeder bus services not large parking lots.

IV. NETWORK NORTHEAST - A SUGGESTED CONCEPT PLAN

The key planning elements described in the previous section can lead to a wide variety of plans. Selecting a preferred plan would require a comprehensive analysis. This kind of planning activity at the NEC scale has not occurred for fifteen or twenty years. No public agency exists today to undertake this effort.

Nonetheless, presenting an initial concept plan is useful. It can help raise interest in a full-blown planning effort and also inspire thinking about other options and alternatives. The NETWORK NORTHEAST plan described in this report consists of two phases, a short range (four-year) action plan, and a set of opportunities that could be fashioned into a longer range (15 to 20 year), comprehensive plan.

The short range plan builds on two earlier efforts, EDF's "NY-NJ-CT Plan for the Millennium" (Reference 2) and a comprehensive four year action plan for the New York City area - the Livable City Transport Plan -- prepared by the Auto-Free New York Committee of Transportation Alternatives for Earth Day, 1990 (Reference 3). These plans call for making much better use of the New York's extensive transit system by running more frequent service at affordable prices and improving security. Motorists would find this vastly upgraded system an attractive alternative to driving. Paying for the transit improvements as well as further cutting down on road use would be a program of road pricing measures like tolls and gas taxes. Extending this concept to the entire NEC would create a seamless public transit system, the key to the short range plan, described below.

The auto is the dominant transport mode for intercity travel in the NEC states. To compete with the auto, extremely high speed is less important than frequent service at affordable fares. Travel speeds on intercity rail, outside of the New York-Washington Metroliners, are far too low to provide an attractive alternative to auto travel. A key feature of the NETWORK

NORTHEAST short range plan is to quickly upgrade existing trackage into a network of high speed rail lines that motorists would find attractive. While diverting some air travel to rail, intercity rail improvements beyond those described in the short range plan will be needed to make major shifts in air travel.

The key long term issue is whether major new high speed rail links can be built in the NEC states, comparable in scale to the extremely high speed (168-186 mph) links recently placed in service in Europe. Building railways on entirely new alignments, even in relatively low density areas in the NEC states, will be costly and disruptive raising many tough environmental issues. Short of building new lines entirely in tunnel or, in a few cases, along existing interstate highway routes, it may not be possible to achieve this kind of high speed rail network in the U.S. A related issue is whether mag lev technology can deliver on its promise of permitting super high speed (300mph) train systems, given the same constraints.

V. THE SHORT RANGE PLAN

High Speed Rail Corridors - Physical Improvements

The short range concept plan, shown in Figure 2, envisions a network of high speed rail lines serving the NEC states. Nine corridors would radiate from the Tri-State Region, extending to all major cities in the NEC states. Fifteen additional corridors would link other cities, creating a comprehensive, interconnected 4,500 mile high speed rail network. These high speed corridors are listed in Table 3.

The key to rapid implementation of high speed rail is to use existing or unused rail lines. A major program of physical improvements would quickly transform these lines into high speed lines. An essential element is to upgrade track quality to high speed standards to allow a maximum speed of 125 mph, where alignments permit. Modern cab signalling would be installed, to prevent mishaps in the event of operator error. Though desirable, full grade separation of all high speed rail lines is not possible initially. In the short term, grade crossing protection would be upgraded. Safe speeds through crossings would be set on a uniform bases, relying on reasonable traffic engineering and safety considerations. For many well protected, lightly used rural grade crossings, speeds of 100mph to 125mph are possible. Selected grade separation projects would be constructed where they would be most effective in permitting higher speeds.

A fleet of lightweight tilt-body, turbine or diesel-powered trains would be built for the bulk of the routes, which are not electrified. Tilt-body trains bank into curves permitting 30 to 40% higher speeds with no loss in comfort. Lightweight trains

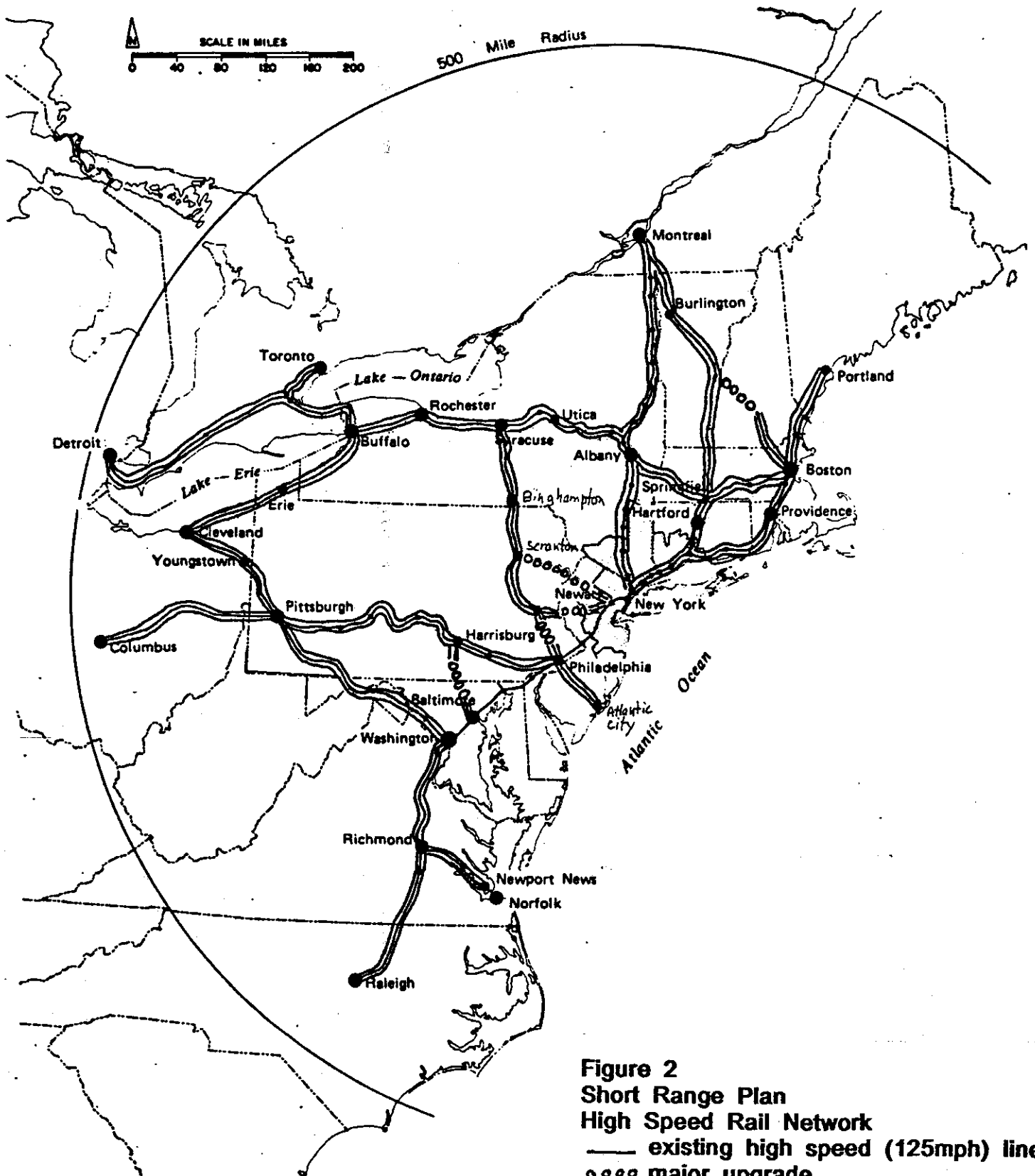


Figure 2
Short Range Plan
High Speed Rail Network
 — existing high speed (125mph) line
 - - - - major upgrade
 (lines out of service)
 ≡≡≡ some upgrade needed

Table 3 - Short Range Plan - High Speed Rail Network

	Corridor Route Miles	Unduplicated Route Miles
New York City-based corridors		
New York-Washington	225	225
New York-Boston via Shoreline Route	232	232
New York-Boston via Inland Route	236	161
New York-Philadelphia-Pittsburgh	444	353
New York-Albany-Buffalo	437	437
New York-Albany-Montreal*	381	222
New York-Scranton-Binghamton	197	189
New York-Allentown	93	82
New York-Atlantic City	147	62
 Other corridors in the NEC states		
Boston-Montreal*	330	330
Boston-Portland	115	115
Boston-Albany	199	101
Springfield-Montreal*	310	123
Buffalo-Toronto*	107	107
Buffalo-Detroit*	271	193
Buffalo-Cleveland*	183	183
Pittsburgh-Cleveland*	138	138
Pittsburgh-Columbus*	191	191
Philadelphia-Bethlehem-Scranton	165	160
Binghamton-Syracuse	79	79
Washington-Pittsburgh	300	298
Washington-Richmond-Newport News	197	197
Washington-Richmond-Raleigh*	305	190
Baltimore-Harrisburg	83	83
 total	 <u>5,167</u>	 <u>4,451</u>

* corridor extends beyond boundary of NEC states

reduce track damage and lower maintenance costs. Equipment on those routes entering New York City through the Penn Station tunnels will require electric propulsion, as well. This can be a supplementary system, similar to turbine trains on the Albany run. It could also be the primary propulsion system, with gas turbines or diesel engines driving generators to power electric traction motors, when the train is not drawing power off the third rail in the tunnels.

Electrification is costly, not only for the installation of the apparatus, but for the increased clearances needed on overhead structures. This is especially a concern on routes with double-stack freight trains. High performance can be achieved using gas turbine or diesel technology. However, as passenger and intermodal traffic densities grow, changes in energy policy occur and central power station emissions are reduced, electrification can become economic and environmentally attractive in the future.

High Speed Service Patterns

On the busy New York-Washington segment of the NEC, very frequent service would be operated. Instead of the current pattern of separate hourly premium fare and hourly regular fare trains, all trains would operate on high speed Metroliner schedules, effectively doubling frequency of service. These trains would offer both regular fare and premium fare seating. In addition, a further 50% increase in frequency is desirable, to one train every twenty minutes. Then train patrons would enjoy an almost timetable-less service on this high density segment of the corridor. Innovative space allocation and pricing techniques, for both coach and first class passengers, are needed to get good usage out of these trains. These all-Metroliner express trains would be supplemented with frequent, through-routed commuter trains offering cross platform connections for local stops.

Since population and ridership levels are lower on the New York-Boston portion of the NEC line, hourly service would be provided. Each hour, one Washington-New York Metroliner train would continue on to Boston using the traditional Shoreline Route, via Providence. Additional service using tilt-body turbine or diesel-powered equipment planned for other corridors in the Northeast would traverse the more populous Inland Route, via Hartford. With some track and signaling improvements on the Inland Route a three-hour running time for New York-Boston express trains, would be possible for either route.

For corridors other than on the NEC mainline, high speed service would be a uniform regular interval bi-hourly headway. This would mean seven or eight high speed trains each way, per day, a major service improvement on most routes which rarely have

more than one or two trains, at present. Furthermore, running times would be cut substantially, by 30 to 50% in most cases. For example, with a 125mph maximum speed, the running time on the relatively high speed, 437 mile, New York-Buffalo line could be trimmed to about five hours, saving from two to three hours over existing schedules. Table 4 shows service improvements planned, for seven New York-based corridors.

High speed trains can greatly improve equipment utilization, with positive impact on operating cost. High service frequencies and more corridors will spread fixed cost over more travelers. However, continuing improvement in crew size and work assignments will be necessary to make this high speed rail plan workable.

High Speed Intermodal Service

High speed rail trackage would also handle intermodal freight trains. Advanced intermodal technology could greatly increase the railroads market share of medium haul traffic, now handled almost entirely by truck. While there are many equipment concepts, the bi-modal "road-railer" type of vehicle has had the most operating experience. This equipment has a lower center of gravity, permitting higher speeds on curves than double stacks or conventional piggyback. With its lower tare weight and better aerodynamic profile it is more energy efficient, produces less wear and tear on the tracks and is more compatible with high speed passenger trains. To be truly successful however, advanced intermodal technology needs to be accepted by the rail industry and installed on a comprehensive national scale.

To increase industry acceptance, the NEC states could serve as a demonstration area. Road-railer service could be extended to all of the high speed lines shown in Figure 2. These low profile trains can even use the Penn Station tunnels in New York, permitting high speed, overnight, intermodal service to New England and to points in Long Island. Diverting truck traffic to these high speed rail lines not only benefits other road users and highway authorities but allows cost-sharing of the substantial investment in upgrading these lines.

Other Rail Freight Operations

The NEC states need to shift as much freight tonnage as possible from overcrowded highways to the NEC rail freight network. While new high speed intermodal freight operations will attract some of this tonnage, improvements to the regular heavy-duty carload freight are also needed. Concentrating this traffic on dedicated lines, separate from high speed lines to the maximum extent possible, would make rail freight service more efficient, improving track capacity and reducing maintenance and operating problems. Figure 3 shows the extensive network of existing rail freight mainlines and secondary lines still remaining in the NEC

Table 4

Examples of Proposed High Speed Rail Service - Short Range Plan

	Route Miles	Existing Service			Proposed Service		
		min.	mph	freq.	min.	mph	freq.
NY-Wash (Metroliners)	225	176	77	34	150	90	102
NY-Wash (conventional)	225	210	64	34	-	-	-
NY-Boston (Shoreline)	232	279	50	18	180	77	28
NY-Boston (Inland)	236	356	40	4	180	79	16
NY-Pittsburgh	444	577	46	4	380	70	14
NY-Buffalo	437	477	55	4*	305	86	14
NY-Montreal	381	611	37	2**	350	65	12
NY-Binghamton	197	-	-	0	175	68	14
NY-Allentown	93	-	-	0	75	74	16
NY-Atlantic City	147	157	56	2	115	82	16

min. - average running time in minutes

mph. - average speed in miles per hour

freq.- number of trains scheduled, average weekday

* 2 additional trains per day do not serve downtown Buffalo station

** 2 additional overnight trains via CT and VT

note:

estimate of proposed running times using tilt-body, turbine or diesel-powered trains on non-electrified routes

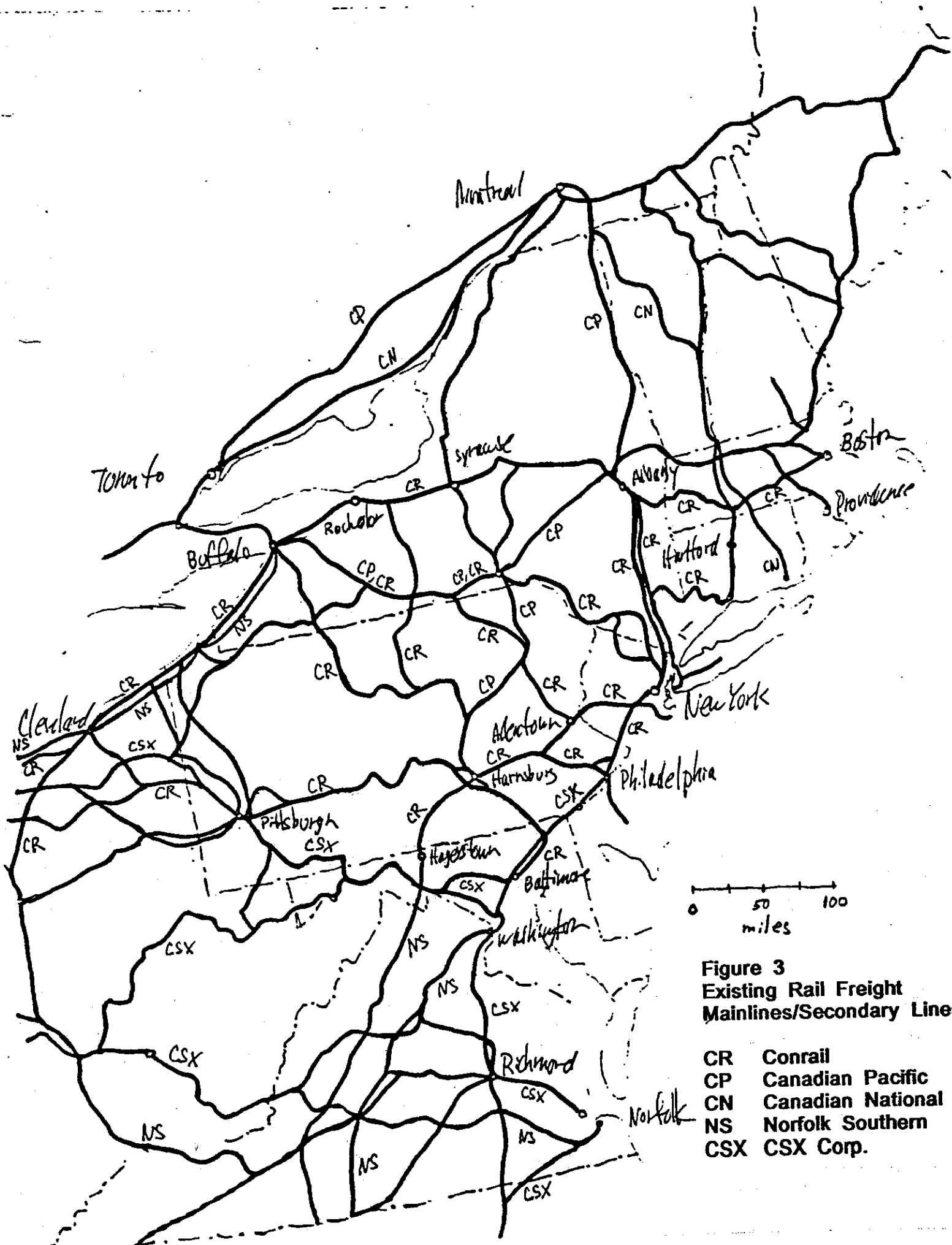


Figure 3
Existing Rail Freight
Mainlines/Secondary Lines

- CR Conrail
- CP Canadian Pacific
- CN Canadian National
- NS Norfolk Southern
- CSX CSX Corp.

states, even after the dramatic cutbacks in the 1970s. For much of the NEC it is possible for heavy duty freight and high speed passenger to have separate routes if the institutional mechanism for pooling privately-owned rail freight trackage can be developed. In several key corridors this separation is not practical or cost-effective in the short term and joint use must continue. For these corridors, like the Harrisburg-Pittsburgh and Albany-Buffalo main lines, unused roadbeds exist where excess trackage was removed. By restoring strategic track segments on these lines, high speed passenger and intermodal service could pass slower moving carload freight trains.

Selected public investments in the privately-owned rail freight network that increase rail market share would reduce the need for costly highway repairs caused by excessive truck traffic. In the New York metro area, for example, upgrading the Cross-Harbor car float facilities and the Bay Ridge freight line would provide new opportunities for carload freight to reach destinations in New York City, Long Island and Western Connecticut. These improvements could be paid by price incentives that encourage freight to shift to rail.

Other Intercity Rail Passenger Services

With the speed-up of high speed rail service in the NEC states, conventional Amtrak services would be limited to long haul services to Florida or the Midwest. Planning for these services, and for high speed rail in general, is a national concern. One opportunity is for overnight sleeping car services between many NEC cities integrated with overnight intermodal trains. A number of tourist railroads using vintage equipment operate in the NEC states. Many of these lines can be extended to reach the high speed rail network.

Intercity Bus Operations

In addition to the major metropolitan area served by the proposed high speed rail network, smaller communities (perhaps of 5,000 population or greater) would be linked to nearby high speed rail stations with dedicated shuttle bus feeders. Major recreation facilities including seashore areas and ski resorts would also be linked. A skeletal intercity bus network would be retained throughout the NEC for travelers who prefer that mode.

Commuter Rail Service

Commuter rail service throughout the NEC area would be upgraded. For the New York area, as described in the EDF plan, joint NJ Transit-LIRR commuter rail services would operate through Penn Station, making better use of that station's limited capacity. Selected Metro-North Hudson Line and New Haven Line

services would also operate to Penn Station to allow public transit to handle more diverse regional travel patterns.

Through-routed services would be established in a number of other locations. For example, services east and north of New Haven would be through-routed with Metro-North, SEPTA and NJ Transit service would be through-routed at Trenton. Virginia and Maryland commuter services would be through-routed in Washington. These are short term improvements that do not require new track connections. Avoiding transfers can be very important in attracting new riders.

Much more frequent commuter rail service is also important. Midday and evening service is needed to permit the rail system to compete with regional auto travel. In the New York area, the busiest lines would have midday rapid transit-like 10 minute headways. Most major commuter lines throughout the NEC would operate at 20 minute, or at a minimum hourly, midday headways. Cost saving measures such as "proof-of-purchase" fare collection and one person train operation could be packaged with dramatic service increases to make the existing labor force more productive.

Integrated Fares

Each metro area in the NEC would have integrated fares. The ideal way for this to be accomplished is by using unlimited ride passes -- good for one month, one week, one day or two hours. These passes would be used for all modes, within a zone system established for the entire NEC area. Passes would be sold for any zone pair within the NEC. Large central cities would continue to have flat fares, through this pass system. Amtrak NEC services would honor passes on a space available basis, off-peak. During busy times, many of the through-routed commuter services proposed for the corridor could handle longer distance travelers at regular fares, while Amtrak would then charge a premium for its high speed service. First class accommodations would be available on the high speed trains.

Use Road Pricing to Pay for Improved NEC transit

Road users in the NEC are not paying the full cost that they impose on the public. Establishing a systematic road pricing system for travel in the NEC and using some of the revenue to upgrade NEC local, regional and high speed rail services is critical. A unified approach to vehicle identification is needed in the NEC states. This could be part of a comprehensive billing system that keeps track of road use in the most crowded or critical areas, and includes motor vehicle registration fees, insurance premiums and safety and emissions inspection schedules. Since diversion of heavy truck traffic to rail could reduce

maintenance cost on NEC state highways, a substantial premium for motor freight carriers would be included.

Establish Mechanism for Cooperative NEC Improvement

The NEC straddles 12 states and the District of Columbia. Clearly the Federal government's responsibility is to deal with issues of interstate commerce. A new Federal entity is needed to foster cooperation amongst the NEC states. To help get this started the Ozone Transport Commission could begin to chart the course for interstate planning in the NEC.

VI. LONGER TERM OPPORTUNITIES

Mag Lev Technology

Many engineers and scientists have expressed considerable interest in the concept of mag lev as a technology for very high speed (300mph) ground transport. Mag lev suspension eliminates the wheel/rail contact, when a train is moving at high speed. Propulsion is provided by linear electric motors. Experimental test tracks are in operation in Germany and Japan. In the U.S., new Federal transport legislation sets aside \$600 million for research, and construction of a 19 mile test track. Mag lev's key advantage, no contact with the ground, translates into lower maintenance cost and no rolling friction. While this is an important gain, it may be offset by the disadvantage that mag lev cannot operate on existing rail trackage. This is critical when entering large cities, where gaining new rights of way may be difficult.

More important, however, is the question of operating trains at very high speeds, whether mag lev or steel wheel. Other difficulties occur. Enormous amounts of energy are required to push the air out of the way, at ground level. Planes solve this problem by rapidly climbing to higher altitudes, where air resistance is less. Very high speed operation requires nearly straight rights of way. Most stretches of interstate highway, in the NEC states, do not meet the alignment requirements. Tilt-body trains that bank as they go around curves, regardless of the supporting technology, must deal with the real limitations of human comfort. There is also the question of which travel market, auto or air, can be attracted to high speed rail. The auto dominates in the U.S., even for trips up to 1,000 miles in length. For rail to compete with the auto, top speeds must be higher to offset the convenience of the car, perhaps 50% or more, but not four to five times faster. Price, and frequency are much more important. Attaining very high speed is very costly. Of course to compete with air travel very high speed is more important. However, if busy NEC airports allocated scarce runway capacity more effectively, using pricing mechanisms, many short

haul air travelers would divert to less costly trains using the planned upgraded rail system.

Upgrading Existing High Speed Rail

The existing Washington-New York NEC line can be upgraded over time in a number of ways. With some improvement, several stretches of the line can handle high speed trains at 150mph or more. Selected curves in less populated areas can be eased, with some local right of way acquisition, to permit longer stretches of 150mph running. At Elizabeth, NJ right of way was set aside, but never used, to allow straightening the tightest curve between Newark and Philadelphia. Elsewhere speed restricting curves in the Metuchen, NJ area could be eased, though with considerable residential and commercial displacement, creating a sixty-mile continuous stretch of 150mph trackage. These curve reductions and higher speeds, coupled with the use of tilt-body trains could reduce New York-Washington running times to about two hours.

For faster speeds, whether using steel wheel or mag lev technology, totally new alignments are required. The New Jersey Turnpike, with its long, straight stretches, is an attractive candidate alignment for the northern part of the New York-Washington route. However, existing interstate highway rights of way in Delaware and Maryland cannot easily accommodate extremely high speed trains. Alignments and space are not available where they are needed most, in urban areas. Also new construction for major river and harbor crossings is involved. A more inland route that bypasses urban areas, proposed in the 1960s, could run into serious environmental problems today.

Upgrading the Boston to New York Line

Locating a very high speed alignment in the New York-New Haven stretch of the NEC is an even greater challenge. Easing the most severe curves on the existing rail line, at Port Chester, South Norwalk and Bridgeport, would be critical. Yet, this would entail major local disruption. A somewhat improved alignment would occur by shifting the line to the nearby I-95 route. However, following I-95 would entail building a costly and conspicuous continuous elevated structure. If acceptable to the community, the structure could be built as the mag lev test track, and later used for steel wheel service, should mag lev not prove feasible.

From New Haven to Boston two routes are in service -- the Shoreline Route and the Inland Route. Both routes involve many curves. Neither route is suitable for very high speed operation. The Inland route is four miles longer than the Shoreline, has fewer extremely severe curves, and serves an intermediate population of 2,434,000 persons, compared to 1,951,000 persons on

the Shoreline Route. The Shoreline Route, the traditional main route, is slated for electrification.

For much better running times on the Boston-New York line, a number of options for the longer term can be explored in a comprehensive way. One route considered by Amtrak, but dropped because of its cost and disruption to nearby communities, was a 30 to 50 mile inland bypass of the scenic, but curve-filled, Shoreline Route. Other options are shown in Figure 4. Table 5 summarizes their characteristics. The longest of these options is the proposed mag lev route along the Massachusetts Turnpike and the New York State Thruway. The shortest would be to build a brand new 102 mile line from New Haven to Mansfield, MA, near Boston, perhaps with a 14 mile spur to Providence. Other options include restoring the mostly abandoned "air line" route, and building a Worcester-Hartford cutoff on the Inland Route, along I-84. With the I-84 cutoff route, and with major upgrading of the Hartford-New York and Worcester-Boston segments, a two hour Boston-New York running time is possible.

Other New High Speed Lines in the NEC States

While building a comprehensive network of new high speed lines might not be cost-effective throughout the NEC states, several high speed rail links, on new alignments in unpopulated areas, are worth considering.

One of the earliest proposals for new high speed rail routes studied in detail in the 1980s was the Philadelphia-Pittsburgh corridor. While the Philadelphia-Harrisburg segment of this route has a relatively high speed alignment, the route west to Pittsburgh encounters difficult mountainous terrain. The famous Horse Shoe Curve, just west of Altoona, PA, is the best known of a great many severe curves that were built into this line. These curves were necessary to overcome the changes in elevation in a gradual way, allowing heavy freight and passenger trains to cross the Appalachian mountains over a century ago. A new 152 mile high speed route through the mountains was proposed in an engineering study a decade ago. Though not considered at that time, a potential addition would be a 67 mile spur connecting this line to the route from Washington to Pittsburgh at Hancock, MD. The new link would shorten the 353 mile Philadelphia-Pittsburgh line by 37 miles and would reduce train travel time to three hours. This is a saving of more than four hours over present service and at least two hours faster than high speed tilt body trains could run on the existing route. The 300 mile Washington-Pittsburgh route would be shortened by 64 miles, and running times would drop from seven and one-quarter hours at present to two and one-half hours. New York-Pittsburgh times of a little over four hours would be possible.

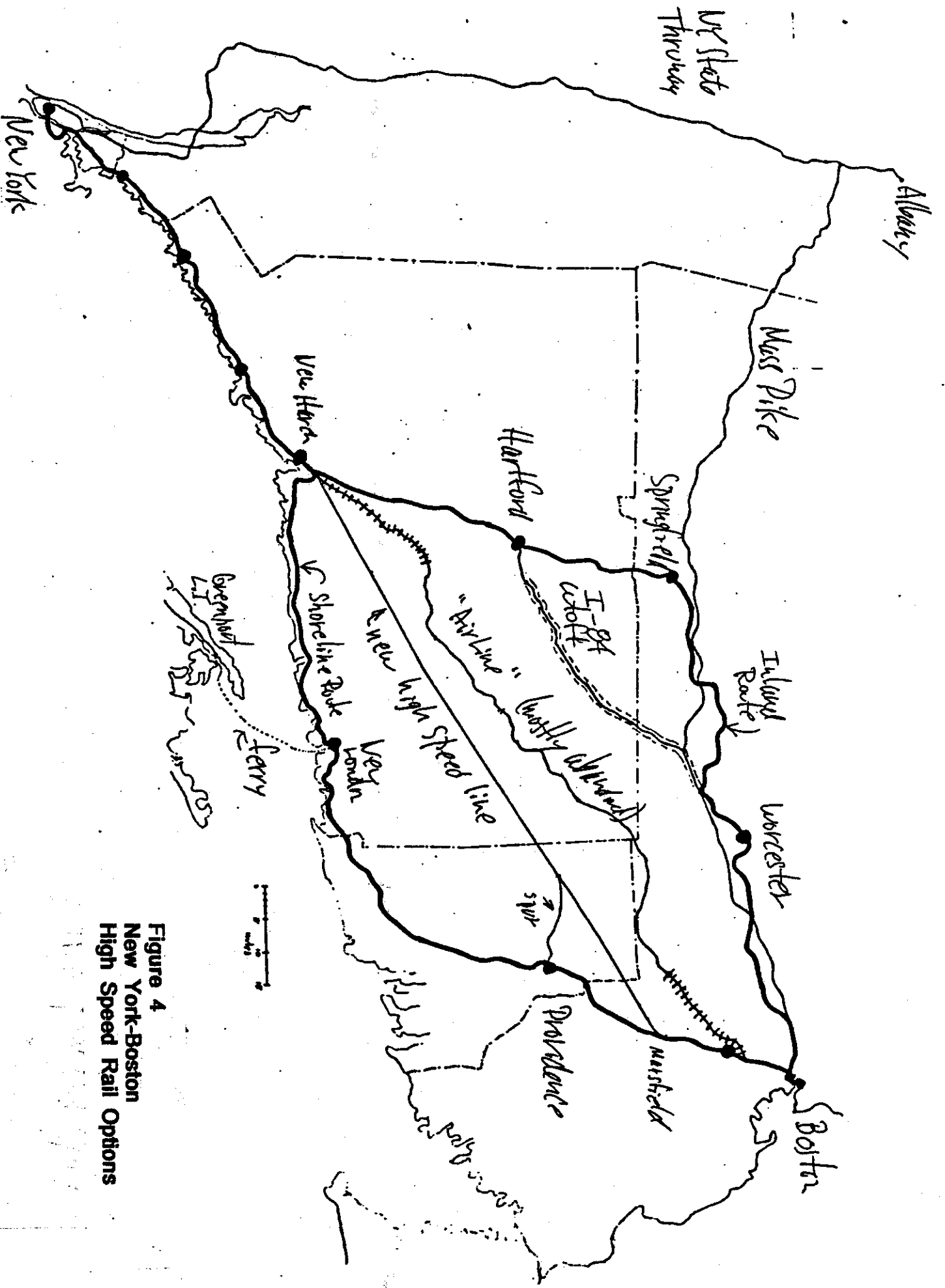


Figure 4
 New York-Boston
 High Speed Rail Options

Table 5 - New York-Boston High Speed Route Options

Miles of Route	Route					
	(1)	(2)	(3)	(4)	(5)	(6)
Existing High Speed	232	75	75	85	100	-
Existing Line Upgraded	-	161	94	43	-	-
Abandoned Line Restored	-	-	-	87	-	-
New Line	-	-	51	-	102*	307
Total	<u>232</u>	<u>236</u>	<u>220</u>	<u>215</u>	<u>202</u>	<u>307</u>

Routes:

- (1) Shoreline Route via Providence
- (2) Inland Route via Springfield
- (3) Inland Route via I-84 cutoff
- (4) "Air Line" Route via Willimantic
- (5) New High Speed Route
- (6) Mag Lev Route via Albany (Thruway/Mass Pike)

* an additional 14 miles of new line for Providence spur
 note: New York-Providence via Shore Line is 188 miles, via new line, 164 miles

Table 6

Estimated High Speed Rail Performance - Long Range Concept Plan

	Route Miles	Minutes	Average Speed
NY-Boston (via I-84 cutoff)	220	120	110mph
NY-Boston (via Providence)	232	150	93mph
NY-Boston (via Springfield)	236	150	94mph
NY-Washington	225	120	112mph
NY-Pittsburgh	407	230	106mph
NY-Buffalo	437	243	108mph
Washington-Pittsburgh	236	150	94mph

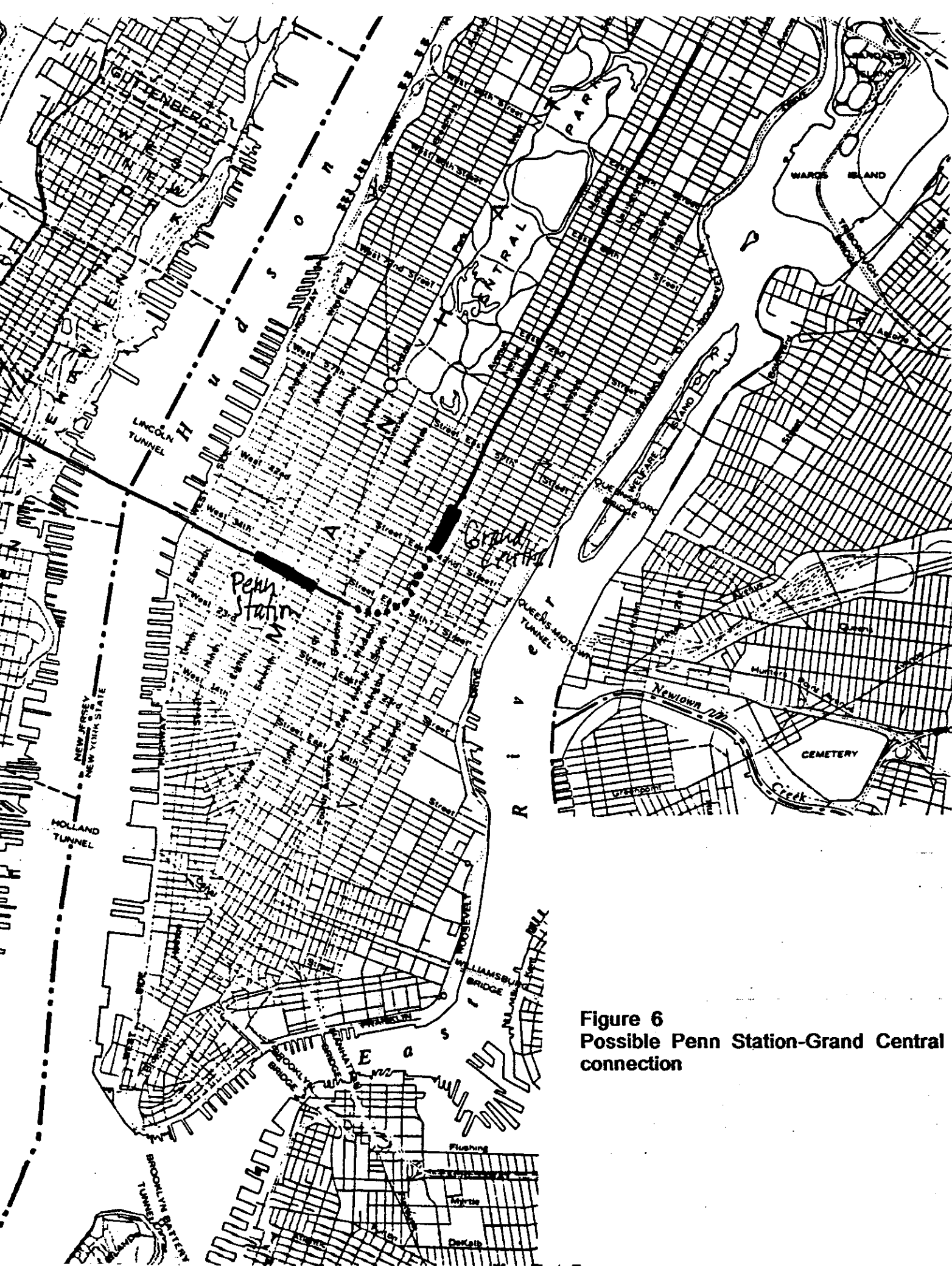


Figure 6
Possible Penn Station-Grand Central
connection

New York State is developing plans to upgrade the New York-Buffalo "water level route" for high speed train operation. While the alignment of much of this route could handle trains at 150mph considerable investment in track and signaling will be needed. In the Hudson and Mohawk Valleys some line relocation will be necessary if suitable routings can be found. Highway grade crossings must be eliminated for trains to operate at very high speeds. This upgrade to 150mph could reduce running times over the short term 125mph upgrade by 60 to 70 minutes on the New York-Buffalo run.

One possible long range concept plan for the NEC states is shown in Figure 5. Five key corridors would be upgraded to 150mph operation -- New York-Washington, New York-Boston, New York-Buffalo, New York-Philadelphia-Pittsburgh and Washington-Pittsburgh. Estimated running times are shown in Table 6.

New High Speed Routes in NEC Cities

While attaining high overall average speeds is important, another consideration in making high speed rail more competitive with air is to locate terminals centrally in the largest cities. In New York City, Penn Station is well located for many destinations, and offers good connections to other modes. However, the greatest concentration of business activity in Manhattan is in the Grand Central area. While direct services from Boston and Albany to Grand Central Terminal are possible, separate services to Penn Station would still be needed to permit connections to the southern half of the NEC. The busier, Washington-New York corridor lacks direct access to the Grand Central area. Through the years a number of proposals have been made to link the two terminals, as shown in Figure 6. This costly connection would be useful for commuter as well as intercity travel.

A simpler link for Philadelphia is possible. The Center City Connection was built several years ago to connect the Pennsylvania and Reading commuter lines. However the NEC mainline skirts the edge of downtown Philadelphia, stopping at 30th St. Station. A connection at North Philadelphia, shown in Figure 7, would allow NEC trains to pass through the core of the business district. This connection would also be useful for through NY-Pittsburgh trains, avoiding a back-up move at 30th St.

In Boston, rail planners are urging a link between North Station and South Station as part of the reconstruction and depression of the Boston Central Artery into a tunnel. In addition to benefitting commuters, this rail link would permit more direct service from the NEC line to Portland, ME. An interim connection, using a freight spur could be used, until the new tunnel is built. This is shown in Figure 8.

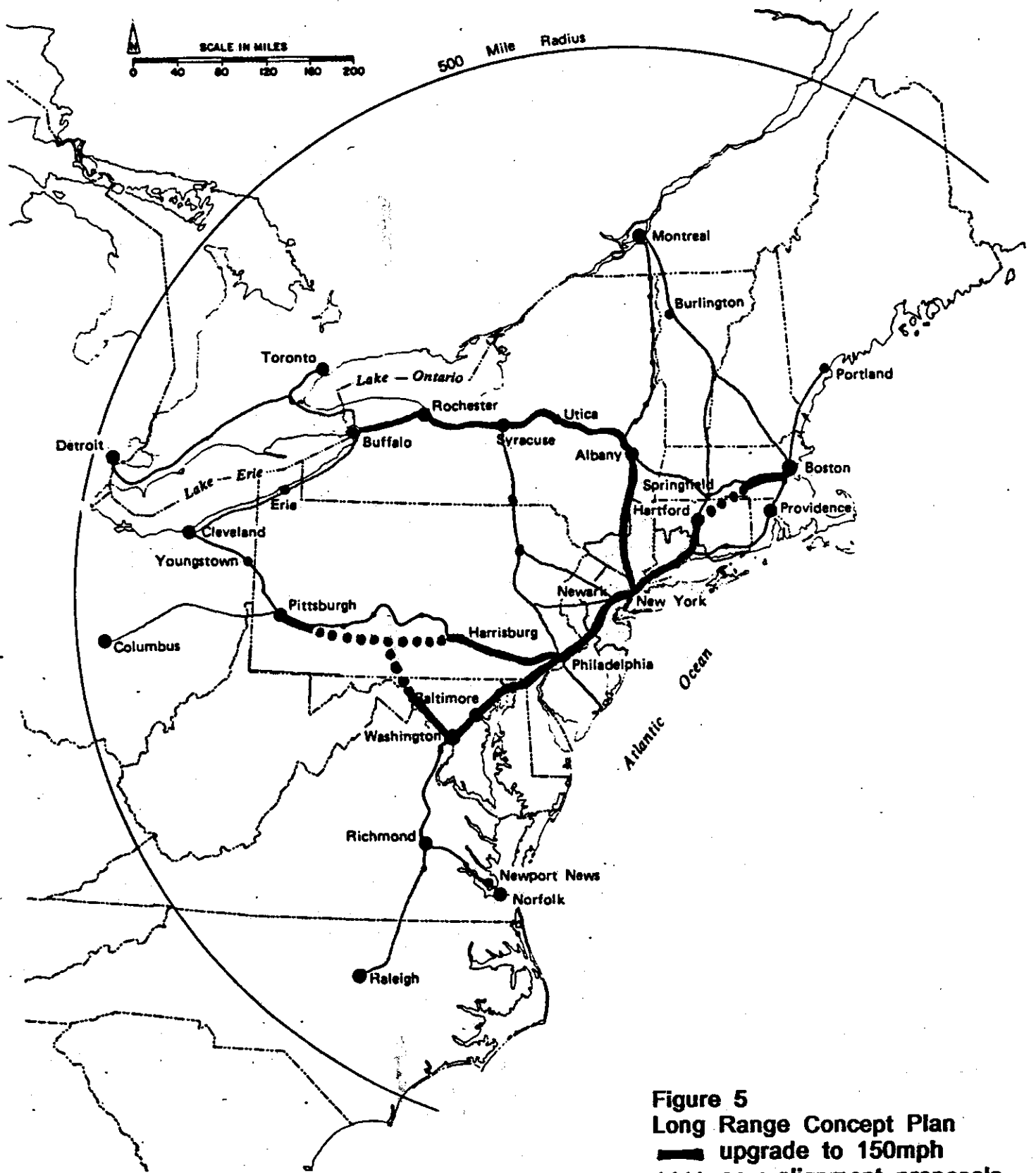


Figure 5
Long Range Concept Plan
—— upgrade to 150mph
..... new alignment proposals

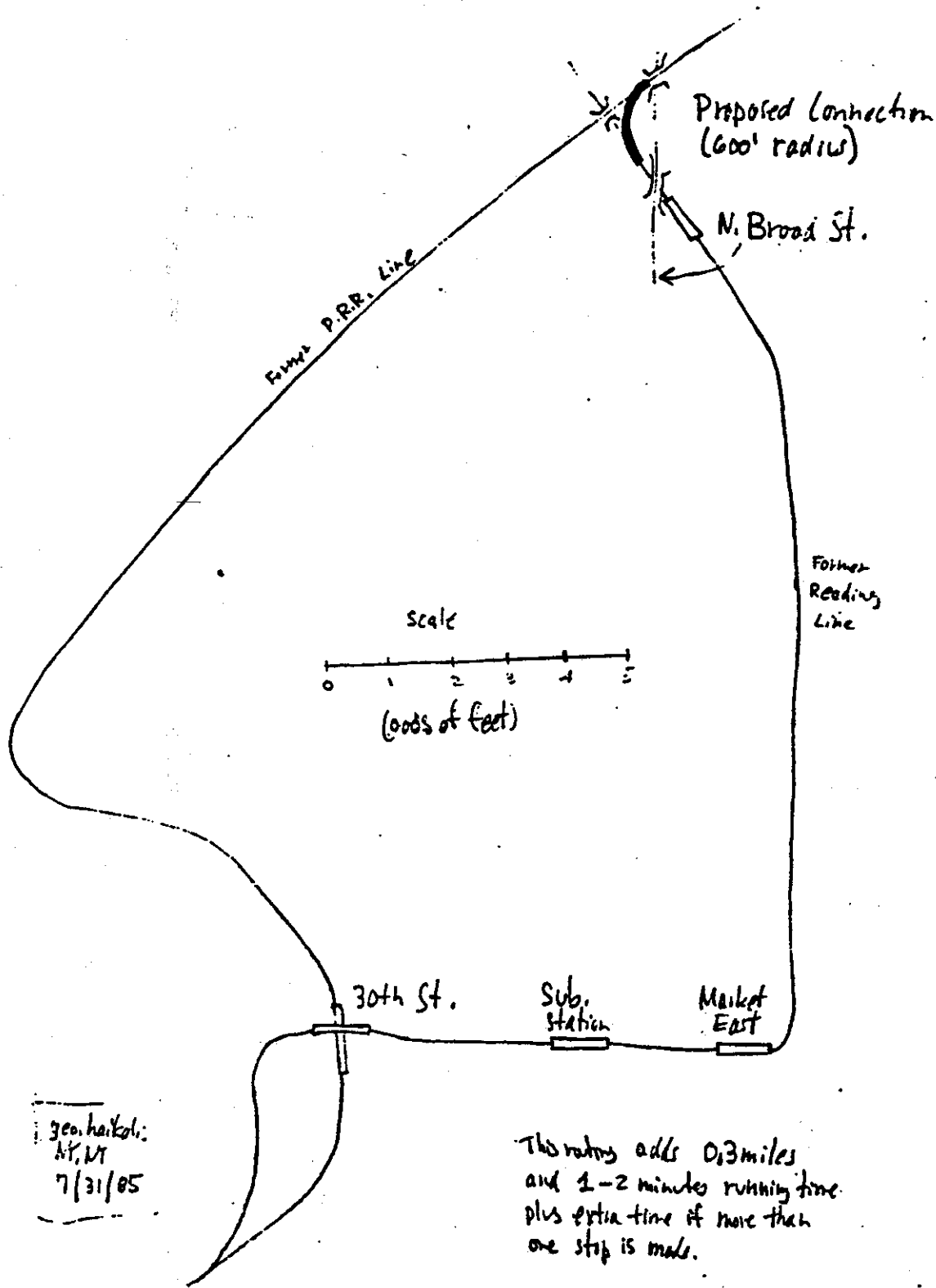


Figure 7
Routing NEC Line through
Center City Philadelphia

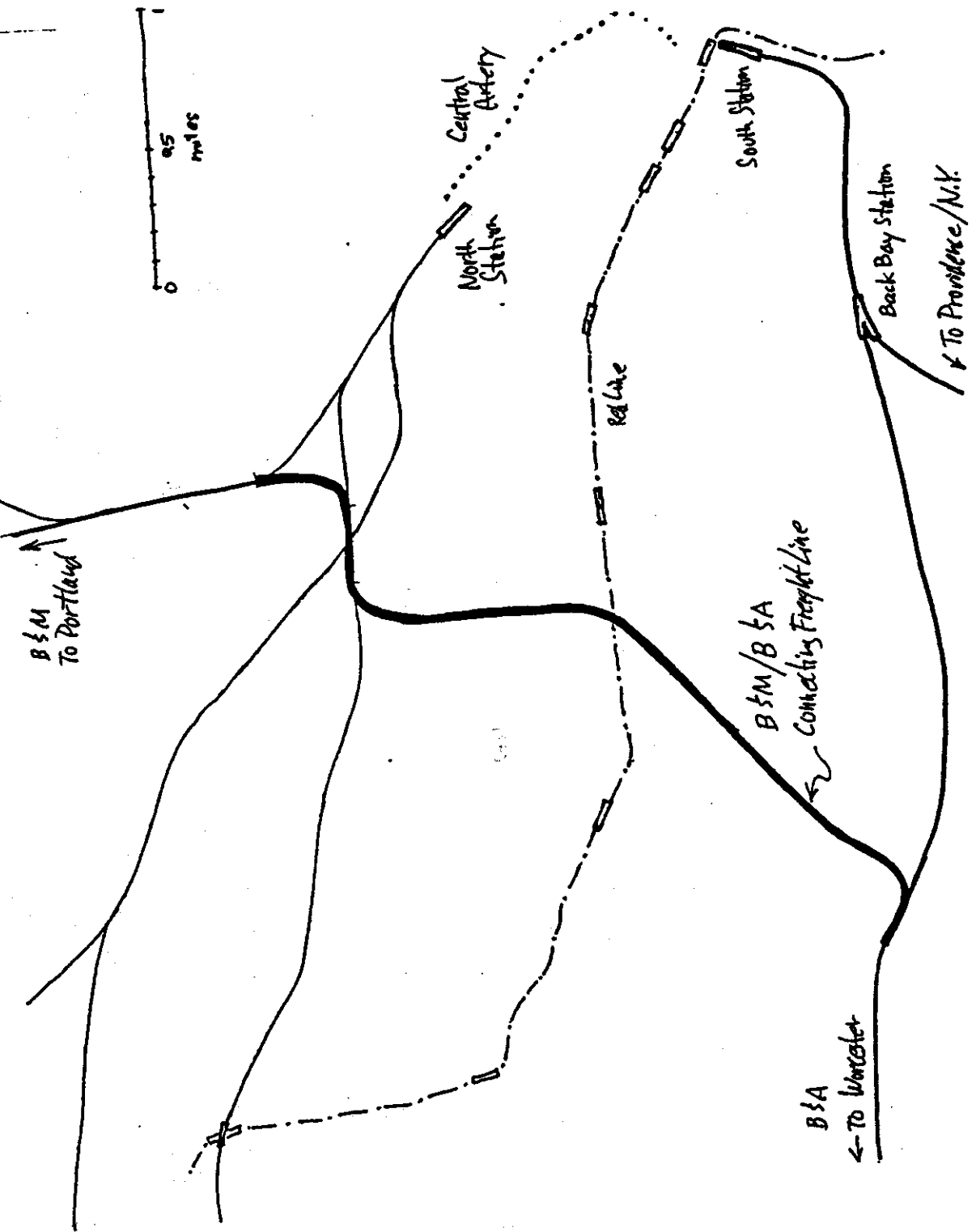


Figure 8
Boston North Station-South Station Connection
and Interim Route for service to Maine

APPENDIX: A STATEWIDE RAIL PLAN FOR NEW YORK

State agencies play a major role in shaping transportation policy in each of the NEC states. While preparing suggested plans for each state is beyond the scope of this report, an example of some of the attributes of such a plan are illustrated for New York State. In general, the planning principles described earlier would guide the development of NY's statewide public transportation plan. In the short term, the goal would be to establish a seamless public transit system, statewide, that would allow travelers to reach most of the states urban places and recreation sites without needing an auto. The more heavily populated downstate area, serviced by MTA, would be connected with upstate metro areas by a greatly enhanced high speed rail corridor.

New commuter rail or light rail systems would be established in four of these upstate areas, as shown in Figure 9. In Buffalo, a 20 mile extension of the existing light rail system along publicly owned abandoned railway lines would link downtown Buffalo with one of the state's leading tourist attractions, Niagara Falls. New commuter rail systems would be established in three or four directions from downtown. In Rochester, the abandoned downtown subway would be restored and a 20 mile north-south link through the subway would connect a lakeside resort community on the north with university campuses on the south. A new east-west commuter rail line would also be started. In Syracuse the rail station would be relocated closer to the downtown at the new Carousel Mall. A new light rail line would link the station with downtown, the university and southern suburbs. In Albany the train station would be brought back downtown by diverting trains over the Castleton Bridge and via a new connection to the West Shore rail line. Two new through-routed commuter rail services would pass through this new station and focal point. A downtown light rail line would connect state offices with the station.

Under this proposal, funding for public transit would become a statewide concern. Flexible funding sources at the State and Federal level could be tapped for transit improvements. Downstate MTA needs would be balanced with high speed rail and upstate transit expansion, not with upstate highways, as has been the practice in the past.

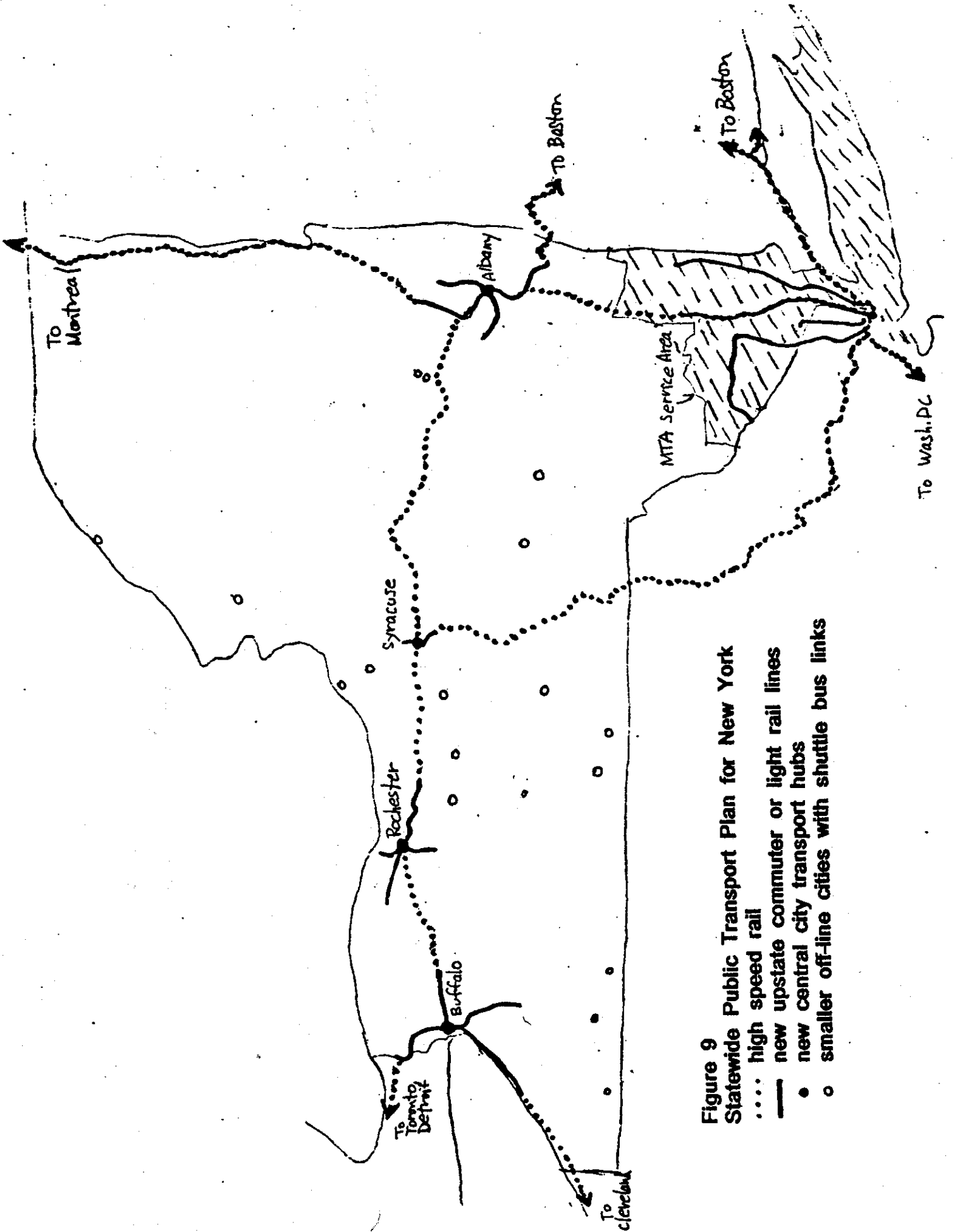


Figure 9
Statewide Public Transport Plan for New York
 high speed rail
 — new upstate commuter or light rail lines
 • new central city transport hubs
 ○ smaller off-line cities with shuttle bus links

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