PENN STATION METRO-HUB

a short term action plan to provide

- o more trains
- o faster service
- o affordable fares

prepared by
The Regional Rail Working Group
September 15, 2003

About the Regional Rail Working Group

Representatives of the region's three leading rail transit advocacy organizations -- the Empire State Passengers Association (ESPA), the Committee for Better Transit and the New Jersey Association of Railroad Passengers (NJ-ARP) -- have joined forces, convening a "Regional Rail Working Group" to formulate a plan for advancing strategic regional rail improvements. This effort, begun in February, 2001, involved a series of monthly meetings of representatives of the three organizations. The initial result is this short term action plan for making much better use of the Tri-State Region's extensive existing rail system.

Remembering Steve Dobrow

A key player in establishing the Regional Rail Working Group, and a long-term advocate for improving public transportation in the metropolitan area, was Dr. Stephen B. Dobrow. Steve was one of the founders of the Committee for Better Transit and its first President. An electrical engineer and devoted educator at Farleigh Dickinson University, Steve dedicated his entire life to improving the ability of others to travel by bus, train, subway and ferry. He was a knowledgeable advocate, using his skill as an engineer to make the case for specific improvements based on an underpinning of analysis and fact. He was a good communicator, writing thousands of letters and making himself available to provide comments to the press, which made him a force to be reckoned with. Many of the concepts contained in this plan were articulated by Steve through the years. Steve passed away on January 13, 2002. He is greatly missed.

Acknowledgments

This report involved the tireless efforts of over a dozen volunteers from the three sponsoring organizations. Meetings were held in space generously offered by Transportation Alternatives and the Alliance for Downtown New York Business Improvement District.

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Executive Summary

Two measures could quickly improve rail travel in the New York-New Jersey-Connecticut metropolitan region:

1. Expand capacity at Penn Station by operating it as a "through" terminal

Operating Penn Station as a "through terminal" will increase peak hour capacity at this busy terminal by 25% or more. This gain occurs because time-consuming conflicts at the approaches to the platforms are avoided by through operation. Regional trains using the Hudson River tunnels, coming from New Jersey would make a stop at Penn Station and then continue directly through the East River tunnels to points in Long Island, the Bronx and Westchester or to Sunnyside yard. Additional trains from Queens and Long Island, using a second set of existing tunnels under the East River, would operate through the northern portion of Penn Station directly to the West Side Yard, also avoiding conflicting moves in the station. A new rail service using the West Side Amtrak line would be added, using the existing stub tracks at the south side of Penn Station.

2. Provide more frequent service and integrated fares

Running more frequent service of at least twenty minute headways off-peak and on weekends will attract discretionary riders. "Cross-accepting" city and suburban MetroCards, so that city riders can travel on commuter rail lines within New York City and suburban commuters can use city buses and subways without paying extra fares, will make these regional rail lines more attractive.

Gains in ridership and operating efficiency make this plan affordable

These changes, which improve the performance of the region's underutilized commuter rail assets, can be achieved without increasing operating cost if transit agencies introduce measures that improve operating efficiency concurrently. Through running improves equipment utilization allowing the substantial service gains with only modest, if any, additions to the rail car fleet. Combining service enhancements with pricing incentives has the potential to increase overall operating revenues by attracting new riders to the system.

Riders from all three states benefit

Residents using non-electrified lines in New Jersey, would gain direct, one-seat ride access to Manhattan. Transit passengers from Eastern Queens, could take speedy LIRR trains, avoiding long, slow bus rides to crowded subways. Transit riders from the East Bronx including Co-op City, could bypass the slower and seriously overcrowded Lexington Subway to reach Manhattan. Non-Manhattan motorists would gain transit options and could avoid congested Trans-Hudson or Bronx-Queens highways crossings.

The bottom line

With full support from elected officials, the region's transit agencies can take full advantage of Penn Station's unique design and convert the commuter rail lines into an efficient regional rail

system -- to equal or surpass the successful examples in London, Paris and Berlin.

PENN STATION METRO-HUB

1. An affordable vision

This report presents a vision for increasing the utility of the commuter rail lines serving the New York-New Jersey-Connecticut Region by bringing them together at a "Penn Station Metro-Hub". Already the focal point for a number of rail lines, Penn Station can become an even more significant hub if the operational and pricing changes recommended in this plan can be achieved. Since the existing rail infrastructure shown in Figure One is largely in place, the plan can be accomplished within four years or less. While the service and fare integration components of this plan will benefit large numbers of travelers in the region, they will not significantly increase transit agency operating deficits. This is because increases in service can be offset by productivity gains and, when packaged with fare innovations, can result in a substantial increase in ridership and passenger revenues.

2. Through-running will produce capacity gains of 25% or more

The elimination of conflicts between inbound and outbound trains at Penn Station by through running has the potential to increase peak hour capacity by 25% or more. Trains from New Jersey would operate through the eastbound Hudson River tunnel, make a stop at Penn Station for inbound passengers to alight, and for outbound passengers to board. Trains would then continue to terminals in Long Island, over the Hell Gate Bridge to points in the Bronx, Westchester and Connecticut or to Sunnyside Yard. In a similar manner, westbound trains would be "through-routed", continuing in revenue service to terminals further west or routed to nearby storage yards in New Jersey.

This concept works best for the central part of Penn Station, specifically tracks 7-16, as shown in Figure Two. At a minimum, five platform tracks could be made available for each inbound tunnel track. If each platform track could be used every ten minutes, capacity becomes 30 trains per hour, per direction. NJ Transit is completing its installation of modern high capacity signaling on the Hudson River tunnels to handle this level of flow and a similar signal system upgrade would be installed on the East River tunnels.

Enhancement of stairway and escalator capacity to these platforms is also needed. Improvements on platforms serving the LIRR were completed a few years ago, and NJ Transit has recently constructed a new East End Concourse for its portion of the station. An additional access improvement, a short extension of the West End Concourse west of Eighth Avenue to reach tracks 7-14, is relatively easy to accomplish. Further gains in stairway capacity would be desirable for the proposed "through running" central portion of the station.

The five northern-most platform tracks at Penn Station, tracks 17-21, connect to two East River tunnels and to the four tracks leading to the LIRR West Side Yard. This portion of the station would also be operated as a "through station" if all inbound LIRR trains made a stop at Penn Station and then continued west to the storage yard. Outbound trains would originate in the yard. Since a large proportion of peak hour trains would be stored in the yard midday, four of the five platform tracks would be used to accommodate peak direction train movement. If each peak direction platform track could be used once every eight minutes, a 30 train per hour capacity would be achieved for this section of the station. Stairway capacity is adequate to meet this level of train activity. A new platform constructed in the yard would accommodate passengers going to the Javits Center and other new developments planned in the West Midtown area.

The six southern-most platform tracks at Penn Station, tracks 1-6, now used primarily by NJ Transit trains, would function as a stub terminal, with more limited capacity. These tracks are linked to the double-track West Side line used by Amtrak's Empire Service through a single-track tunnel under the West Side Yard. By moving turnouts closer to the tunnel portals, the length of this single track segment could be reduced to a about a half-mile. Because of the tight curve in the tunnel, train speed is limited to 15 mph, resulting in a theoretical minimum headway of six minutes in each direction. A more practical operation would be about one train every ten to twenty minutes. This would permit a frequent West Side service for Metro-North as well as an hourly high speed service to Upstate points. An important variation would be to handle this train flow at a four track stub terminal, releasing tracks 5 and 6 for through train service.

Capacity increases would be gained on both sides of the Hudson River. Increasing morning peak hour train capacity from New Jersey to New York from the 21 trains now scheduled, to a potential of 25 to 30 trains per hour would permit more frequent service on existing overcrowded services, and could allow the introduction of new trains from branches that now lack direct service, such as the Raritan Valley Line. Similarly, the potential of 50 to 60 trains per hour through the East River tunnels, where 38 per hour are now scheduled, allows new travel markets to be tapped. More frequent service from LIRR stations in Eastern Queens would help shift loads from overcrowded subways. A new Metro-North service across the Hell Gate Bridge would be feasible immediately. A one-seat ride from Kennedy Airport to Penn Station, accommodating passengers from Central Queens and the Rockaways, should also be part of this near-term plan.

Amtrak would also benefit from this capacity enhancement. Capacity gains on Amtrak could also be achieved by modeling its Northeast Corridor high speed service more along the lines of the French TGV or German ICE services. In Europe, much longer, multi-class trains are operated instead of duplicate, shorter high fare and basic trains which use more track space.

These capacity gains can be achieved within a four-year period. Designing and installing new signal systems and ordering new rail equipment can all be accomplished in this time period. An interim through service -- extending some NJ Transit Northeast Corridor Line trains across the Hell Gate Bridge to New Rochelle -- could begin almost immediately. New under river tunnels, though desirable, will take much longer to implement.

3. Frequent peak and off-peak service is essential

More frequent service is essential if the commuter rail system is to attract discretionary riders for travel to the region's core and is to compete with auto travel for more dispersed markets. For shorter distance trips, and for trips requiring a connecting bus service, current hourly mid-day headways are inadequate. At a minimum, 20 minute intervals, off-peak and on weekends, are critical to gain riders in these travel markets. This frequency is economically feasible if one-person train operation and proof-of-purchase fare collection systems are put into place during off-peak periods. These practices are already standard for new light rail systems, including NJ Transit's Hudson-Bergen LRT line. By tripling service, and cutting crew staffing by two thirds, the existing labor force would be used much more productively, making these service levels affordable. Cooperation with organized labor is essential to make these changes workable.

At certain locations, where two 20 minute headway off-peak services overlap, a rapid transit-like ten minute headway becomes possible. This would occur on the Rahway-New York segment of the Northeast Corridor line and on most LIRR and Metro-North lines in New York City.

While many through-service combinations are possible, those that are driven by equipment considerations may be the most cost-effective. For example, service over the Hell Gate Bridge is best matched with electrified service on NJ Transit's Northeast Corridor or Morristown Lines. Non-electrified lines on either side of the Hudson River would be paired using dual-mode locomotive propelled service. Raritan, Bay Head and Mountain Lakes (or Netcong) services on the west could be through routed with Oyster Bay, Port Jefferson and Patchogue service to the east. Generally, LIRR branches that are fully electrified would use the northern portion of Penn Station that continues to the West Side Yard.

With eight or nine regional rail branches on either side of the Hudson River converging at Penn Station, the opportunity exists for diverting some motorists who now have no choice but to use congested bridges and tunnels. The disbursed nature of non-Manhattan trips suggests that most of these travelers will have to transfer. This can take place at the Newark, Secaucus and Sunnyside intermodal stations as well as at the Penn Station Metro-Hub. To the extent that a substantial volume of travel might be developed for a single through route, it would be on the Northeast Corridor, linking residential areas in central New Jersey with business centers in Connecticut.

Airport travel is another market that could be developed with good cross-Manhattan links. Newark Airport would be accessible to many LIRR and Metro-North riders through the Penn Station Metro-Hub. A direct Penn Station-Kennedy Airport link also becomes feasible with increased capacity developed in this plan. While a transfer at Jamaica would link the AirTrain system with Penn Station-bound LIRR trains, a one seat ride would produce a more appealing service, particularly for New Jersey and Amtrak passengers. The preferred route, from a passenger and rail operator perspective, would be the re-activation of the LIRR Rockaway Cut-off in Central Queens. While Kennedy Airport platforms limit train length to 240 feet, longer trains could be operated, with doors only opening on cars berthed at the station platforms, as is

current practice on many commuter rail lines. These additional cars could handle passengers traveling from other Queens stations served by the cut-off -- Aqueduct, Ozone Park, Woodhaven and South Forest Hills -- reducing travel time to Midtown Manhattan by as much as thirty minutes. The capacity gains resulting from through-running at Penn Station and the restoration of the cut-off in Central Queens opens the way for direct train service from the Rockaway Peninsula, and from Howard Beach, as well.

4. Dual-mode locomotives can permit through service on non-electrified lines

Dual-mode locomotives offer a short term solution to quickly gain the benefits of through-running at Penn Station, as well as to attract more riders on non-electrified lines. Extending electrification takes considerable time to design and construct and requires sizable financial resources.

Some key rail lines in suburban New York, New Jersey and Connecticut remain non-electrified. Over forty years ago rail lines serving the northern suburbs pioneered the use of dual-mode locomotives to permit through service to Manhattan's underground rail terminals, avoiding costly and time consuming changes in locomotives. Dual-mode locomotives have on-board diesel engines producing power to drive electric motors propelling trains, similar to conventional locomotives widely used in the U.S. In electrified territory, they draw power from the third rail and perform as straight electric locomotives.

Over the past five years, Metro-North and Amtrak have introduced a new generation of dual-mode locomotives, incorporating many advanced features. The units have proven reliable, particularly in high density peak hour service on Metro-North lines.

Until recently, the LIRR required passengers from non-electrified lines to transfer to reach Penn Station. The railroad is introducing a new fleet of 23 dual-mode locomotives to permit through service. NJ Transit has extended electrification on some lines but still requires passengers to transfer where it has not made this investment.

5. Most platforms should be high-level to speed boarding

For a flexible and effective through operation it would make sense to equip most, if not all stations with high level platforms. Passengers prefer floor height platforms because they speed boarding and reduce tripping hazards. Avoiding the need to have crews to open "traps" on cars to make stairways operational becomes an increasingly important feature when considering substantial increases in off-peak train service.

High-level platforms were an important innovation when first constructed at Penn Station in 1910 and at Grand Central Terminal in 1913, allowing passengers to exit and board trains more rapidly and comfortably than at low level platforms. Stairs were still needed for rail cars since few other stations in the U.S. were equipped with high level platforms.

In the 1960s, MTA decided to replace it aging fleet of electric multiple unit cars and chose a new high performance car design that could only serve high levels platforms. New platforms were quickly installed at all stations that did not have this feature, on electrified lines. Recently, as part of its plan to replace locomotive-hauled cars on its non-electrified lines, the LIRR put into service a fleet of 134 bi-level cars. Since these cars could only be boarded at high level platforms, all stations on non-electrified lines were converted.

NJ Transit has followed a more incremental approach, generally purchasing cars that can serve both low and high level platforms. Stations are gradually being modified with high level platforms, but some stations, primarily on the Morristown Line, are not expected to be converted due to historic preservation concerns. Clearly, if LIRR bi-levels and dual mode locomotives were operated in through service to non-electrified lines in New Jersey, all remaining low level platforms on these lines would need to be converted.

6. A simplified, affordable and integrated fare system is needed

To be really effective and to attract new riders, a regional rail system requires an integrated fare structure. MTA has seen great success with its MetroCard system that permits bus and subway riders to transfer without a fare penalty. Travelers can now optimize their travel patterns, choosing their preferred route and mode. The transformation of commuter rail into a true regional rail system will require a similar fare integration. Because of high fares and infrequent service, few riders board commuter rail stations in New York City. Little revenue loss would occur if the city's MetroCard were honored at commuter rail stations in the city. With its recent fare increase, MTA authorized a new "City Fare" for its commuter rail lines within New York City. This is a welcome step toward full fare integration.

Integrated fares for suburbanites are also important. While high fares are sustainable for travel to the Manhattan core, commuter rail becomes less competitive with the auto when a transfer to a city bus or subway is required. The inconvenience of a transfer is compounded when riders pay a fare penalty. MTA is beginning to move toward fare integration, offering monthly commuters a 9% discount on joint MetroCards, usable on city buses and subways, and converting all commuter rail tickets to MetroCard stock.

MTA, working with NJ Transit, should complete this integration by taking the logical next step -- offering a free transfer between commuter rail lines and the New York City bus/subway system. Since giving rail commuters free transfers to city buses and subways largely benefits suburban commuters, this should be balanced by allowing New York City residents to use their MetroCards to travel on commuter trains within the city. The revenue loss to the city/bus subway system, and the increased operating cost for commuter rail lines to carry more city riders, would be small -- and quite conceivably be largely offset by an increase in ridership -- as was the case to a surprisingly large extent when MTA initiated free transfers between city buses and the subway.

In New York City, the need to disperse residents from Manhattan's overcrowded and unhealthy

tenements nearly a century ago led to the flat fare for subway travel within the city. With the introduction of the MetroCard, the city's bus system was finally brought into this common fare boundary. Extending this city fare to include travel on the commuter rail system within the city greatly increases the usefulness of the regional rail system.

7. The central fare zone should include New Jersey's congested core

New Jersey has much further to go to achieve integrated and affordable fares and service. Its bus and rail systems remain largely duplicative, with only a minimum of coordination. To take full advantage of the transformation of NJ Transit's commuter rail lines into a regional rail system, a major change in the rail fare structure is required. At present, the bulk of the revenues generated by passengers using the commuter rail system come from longer distance commutes of 15 to 50 miles or more in length. Residents of nearby cities like Newark, Elizabeth and Paterson make little use of the commuter rail lines for short distance travel within the densely developed core of New Jersey. Instead, some use local buses which are slow and costly to operate. Most drive, and the result is the state's legendary roadway congestion experienced in the core area.

Extending New York's "city fare" for travel within a common central zone, encompassing both sides of the Hudson River, would produce dramatic increases in transit ridership in the most congested parts of New Jersey. New Jersey local buses serving this common zone would also be equipped with MetroCard fareboxes, permitting a single integrated bus/rail fare. Initially, the central zone in New Jersey might be limited to the City of Newark and Hudson County, as shown in Figure Three. Eventually, the common central zone on both sides of the Hudson River would be located roughly within a fifteen mile radius of New York's Penn Station.

The revenue loss from the relatively small number of riders using the NJ Transit rail system for travel in the core, or the even smaller number of riders paying two fares for combined bus/rail travel, will be modest. This loss will be more than offset by new revenues generated by increased ridership and by operating cost savings resulting from coordination of bus and rail services.

Completing the fare integration process in New Jersey would be the honoring of commuter rail tickets from stations beyond the central zone for local travel in New Jersey's urban core. The combined advantage of increased regional rail service and the elimination of fare penalties could attract many motorists from crowded highways in the core.

Access to regional rail stations located beyond the central zone is generally by auto. Efforts should be made to add specialized bus or van services and to improve walking and bicycle facilities where feasible. At some locations, increased parking may be desirable.

8. Newark and Kennedy Airports should be included in the central fare zone

Experience at NJ Transit's rail station at Newark Airport indicates that some air travelers are willing to pay a substantial premium over regular rail fares for airport service. However, high fares do deter use, especially for employees who often have free parking and for airport visitors who must make a round trip. Minimizing auto use at airports, clearly an important measure to diminish highway congestion and improve air quality, is now even more critical as a means to increase security and reduce the risk of terrorist attacks at airport terminals. To maximize transit use, regional rail service to airports should be priced at the same level as service to other destinations within the same zone. Both Kennedy and Newark Airports fall within the fifteen-mile radius central zone and transit service should be priced accordingly.

Furthermore, the Port Authority limits access only to airport users at the Newark Airport train station, preventing potential regional rail users who live or work near the station from reaching it by walking, driving or using local bus service. This action also forecloses the opportunity for much-needed economic development at the airport station in Newark. Either the Port Authority's narrow interpretation of the restrictions on Federal aviation funds should be addressed and changed, or the legislation authorizing these funds should be amended.

9. Better use of existing rail cars can increase service quickly and efficiently

The substantial increase in rail ridership anticipated in this plan will require an increase in service and equipment. The introduction of bi-level cars and dual-more locomotives permits a rapid increase in train service on the LIRR. By routing lightly-patronized trains that now terminate at Hunters Point or Long Island City directly into Penn Station, duplicate seats on electric and diesel trains can be used more effectively. Retaining and rehabilitating some of the LIRR electric cars, now slated to be scrapped, offers another short term option for equipment gains. These cars could also be converted to locomotive-hauled operation to lengthen dual-mode operated trains. NJ Transit has purchased new single-level and bi-level cars to expand its fleet. The key to service increases is the higher capacities and improved equipment utilization made possible by through-running at Penn Station.

10. The bottom line

With full support from elected officials, the region's transit agencies can take full advantage of Penn Station's unique design and convert the commuter rail lines into an efficient regional rail system -- to equal or surpass the successful examples in London, Paris and Berlin.

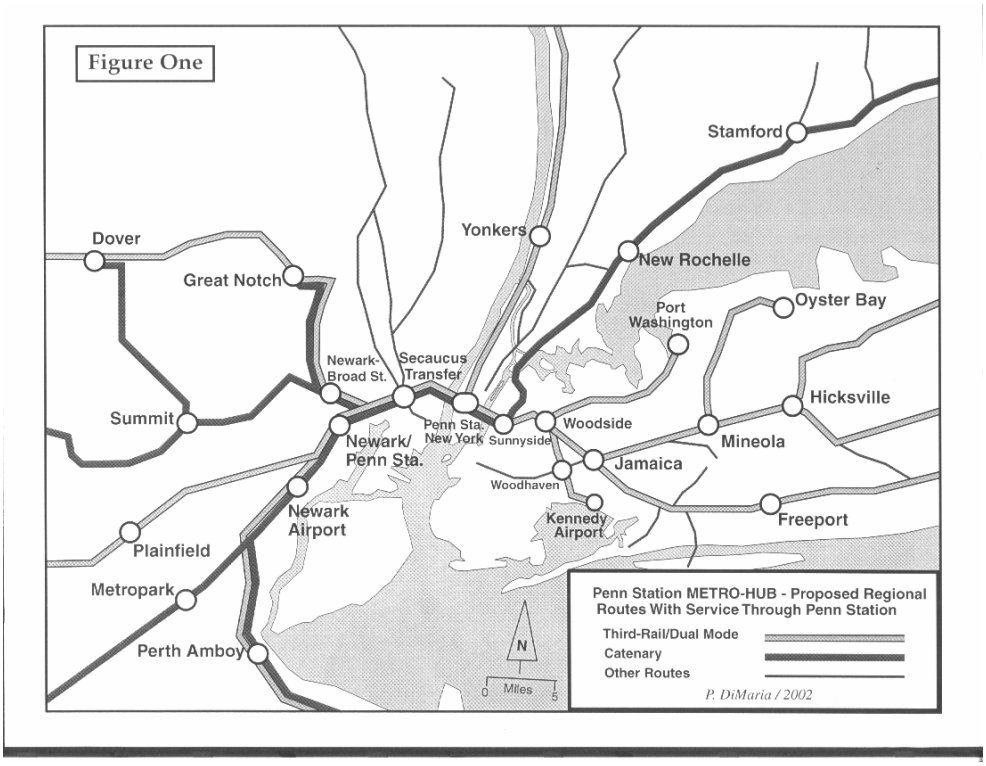
Figure One
Stamford
Yonkers
Dover
New Rochelle
Great Notch
Port Washington
Oyster Bay
Newark-Broad St.
Secaucus Transfer
Hicksville
Summit
Penn Sta. New York
Sunnyside
Woodside
Mineola
Newark/ Penn Sta.
Jamaica
Woodhaven
Newark Airport
Kennedy Airport
Freeport
Plainfield
Metropark
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Penn Station METRO-HUB - Proposed Regional Routes With Service Through Penn Station
Third-Rail/Dual Mode
Catenary
Other Routes
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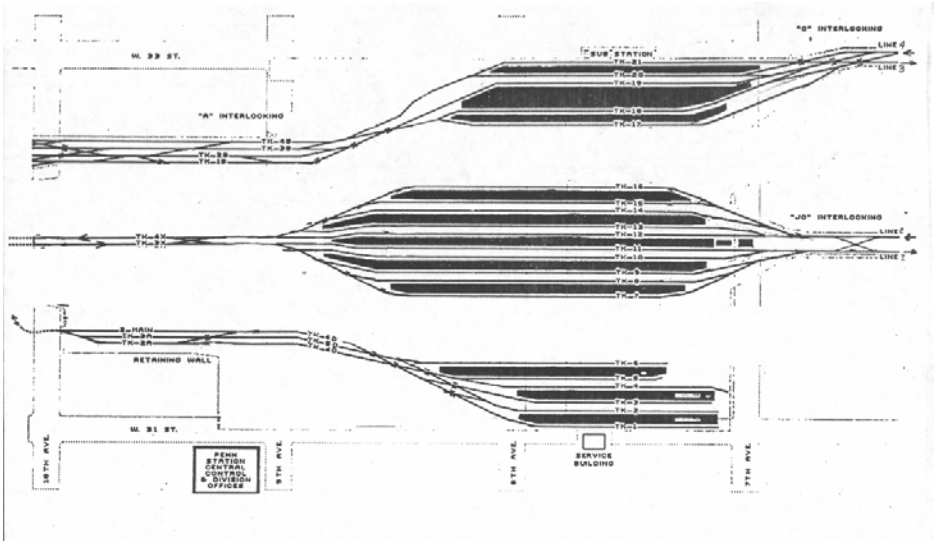

FIGURE 2 - Proposed Penn Station Metro-Hub Track Layout

Tracks 1-6 -- Stub trucks for West Side Line - M-NR Hudson Line/Empire Service
Tracks 7-11 -- Eastbound Through Running - NJ to LI/Hell Gate
Tracks 12-16 -- Westbound Through Running - LI/Hell Gate to NJ
Tracks 17-21 -- LIRR connecting to West Side Yard

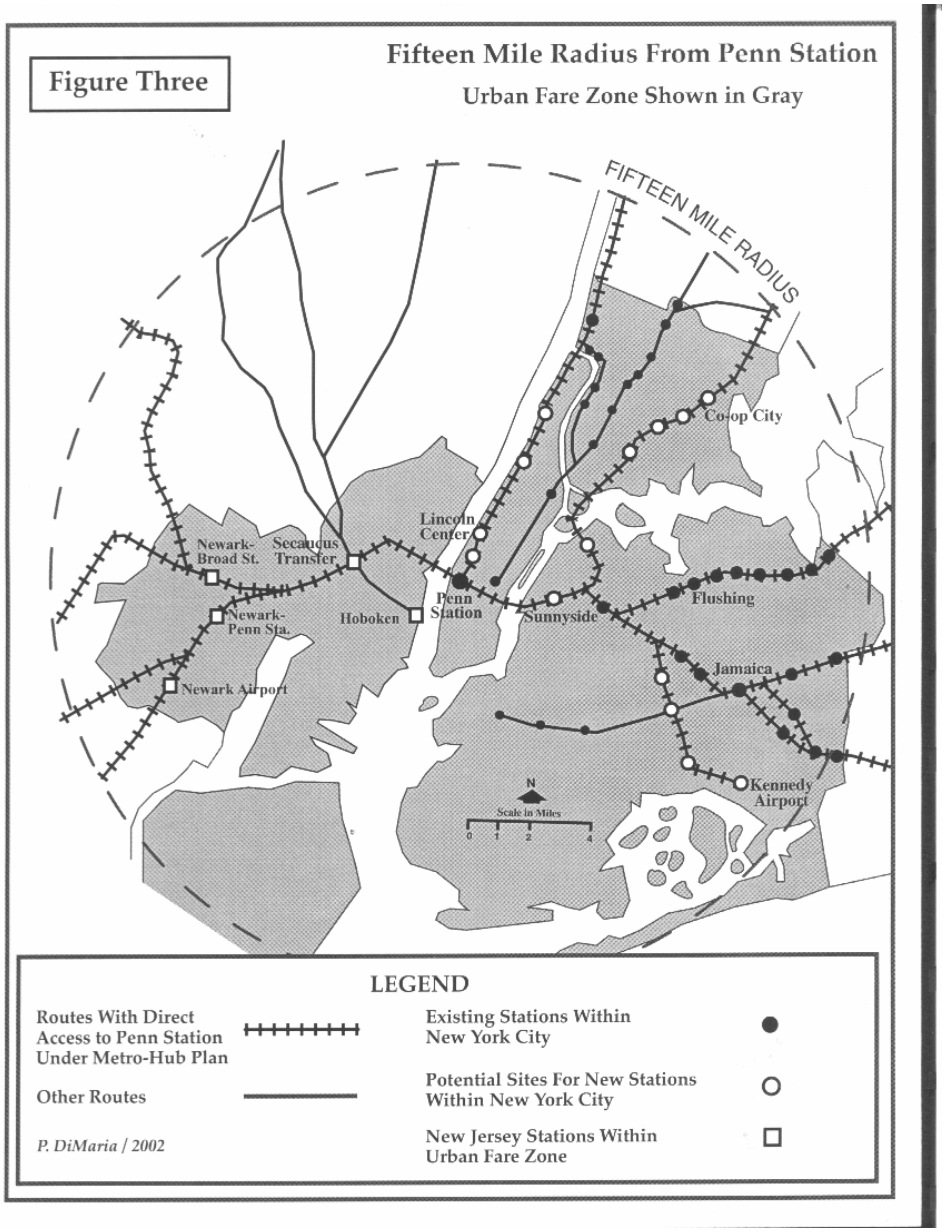
Figure Three
Fifteen Mile Radius From Penn Station
Urban Fare Zone Shown in Gray
FIFTEEN MILE RADIUS
Co-op City
Lincoln Center
Newark-Broad St.
Secaucus Transfer
Penn Station
Hoboken
Sunnyside
Flushing
Newark-Penn Sta.
Newark Airport
Jamaica
Kennedy Airport
N
Scale in Miles
0 1 2 4
LEGEND
Routes With Direct Access to Penn Station Under Metro-Hub Plan
Other Routes
P. DiMaria / 2002
Existing Stations Within New York City
Potential Sites For New Stations Within New York City
New Jersey Stations Within Urban Fare Zone