

The Hudson Terminal Plan

A Bold Transit Proposal for New York and New Jersey's
Long-Term Prosperity

September 2014 Update

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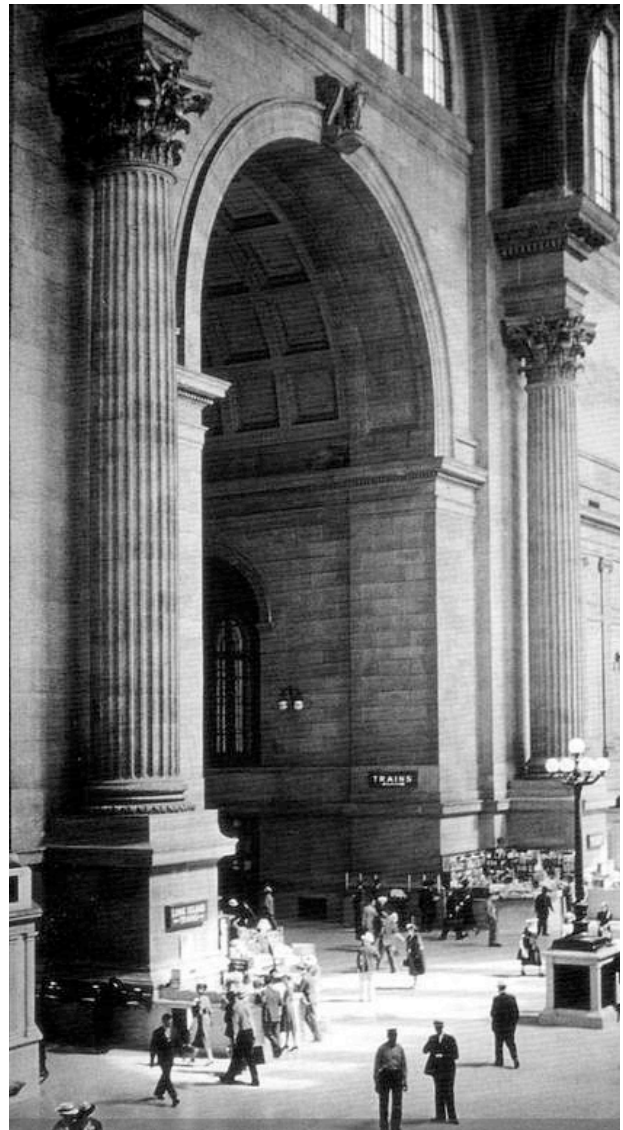
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Stipulations

The City of New York stands at a crossroads. For the past decade, Manhattan's commercial districts have experienced an unprecedented building boom. Capital improvements that have been on the table for years are finally underway. But looking ahead, as we prioritize our infrastructure planning in light of fiscal instability that has threatened key metropolitan agencies, the region needs to make difficult decisions regarding its future. In one direction, the City can continue to invest in its infrastructure and real estate development to promote growth and prosperity for the region as a whole. In the other direction, the City can take austerity measures to conserve resources, but in the process, risk entering a period of decline that may threaten long-term growth.

These circumstances may sound familiar, but the year is not 2014. It is 1959. And over the next two decades, instead of investing in wide-reaching mass transit projects, New York City would act conservatively, abandoning many of the pro-growth policies that created its post-war prosperity. During this time, transit workers went on strike, the Second Avenue Subway was abandoned, and the original Penn Station was demolished. As subway ridership declined, revenues fell and the transit authority cut back on station maintenance and the purchase of new equipment. In turn, fewer people rode the deteriorating subway, revenue fell, and the cycle of decline continued as New York City was unable to simultaneously maintain previously-successful transit systems while adapting to changes in the transportation and real estate demands of



Original Penn Station, 1960s



Penn Station in 2013

middle class shrinks, and commuters increasingly choose to travel by rail, the demand for efficient commuter rail and mass transit systems is quickly rising. But the region's transportation infrastructure is outdated and cannot keep up with this increasing demand. At the heart of this problem lies the heart of the system—Penn Station. What began as a grand ode to the Pennsylvania Railroad Company's success is today an unnavigable substructure beneath the Madison Square Garden complex. From a design perspective, Penn Station suffers from dual capacity problems. First, the 100-year-old pair of single-track tunnels that feeds trains into Penn Station from New Jersey severely limits the number of hourly trans-Hudson crossings. Second, Penn Station itself has a shortage of tracks and platforms, which creates unavoidable traffic within the already overburdened system. In spite of its shortcomings, Penn Station remains the busiest transit hub in North America. As New Jersey's population is expected to increase by 1.7 million residents over the next 20 years, Penn Station cannot accommodate more trains during peak hours. Ridership continues to grow, but without the possibility of increases to service. For Amtrak, at a time when high-speed rail has become the focus of the future, Penn Station is not prepared to usher in a new generation of trains and passengers. It has become abundantly clear that the current iteration of Penn Station has outlived its usefulness, and a comprehensive solution is long overdue.

the region, chiefly due to the rise of the automobile and exodus of middle-class residents to the suburbs. The city had stalled because political leaders chose to invest modestly instead of planning ahead for the region's changing needs.

There are obvious parallels to the present day. Manhattan's commercial districts have experienced tremendous growth over the past decade and several large capital projects will be completed in the upcoming years. Yet unemployment in the late 2000s and early 2010s has slowed growth, and transit agencies such as the MTA and NJ Transit face rising budget deficits that threaten future investment. Although New York may not risk returning to the hardships of the 1970s and 1980s, the City does indeed stand at a crossroads. Moving forward, it is imperative that metropolitan agencies make responsible investments in transportation infrastructure and real estate development so that the region will continue to prosper in the future.

Much like the fundamental trend away from rail and towards the automobile in the 1950s and 60s, today, the trend is reversing. As gas prices continue to escalate, the

Penn Station Weekday Service (1982 vs. 2013)

	1982	2013	Overall Increase
LIRR Daily Ridership	205,000	233,000	14%
LIRR Daily Trains	360	544	51%
NJ Transit Daily Ridership	62,000	176,000	183%
NJ Transit Daily Trains	167	439	163%
Amtrak Daily Ridership	21,000	30,000	43%
Amtrak Daily Trains	177	266	50%

Over the past several years, a number of proposals have come to the forefront of the debate regarding how to address the wide-scale problems associated with Penn Station's capacity restrictions. Many of these proposals call for the expansion or replacement of Penn Station. However, due to existing infrastructural limitations as well as legal and political obstacles, these proposals come with great costs for only partial solutions. This is not to say that the ongoing efforts to rebuild Penn Station should be abandoned at all. To the contrary, the abundance of existing infrastructure makes the question of rebuilding Penn Station less about if and more about when and how. But during the decades it may take to reach an ultimate solution at Penn Station, there are significant opportunities to improve the status quo in the interim by looking for ways to upgrade the region's infrastructure outside of Penn Station. And in preparing to take the next steps forward, it is crucial that any comprehensive plan seeks to accomplish a number of key goals:

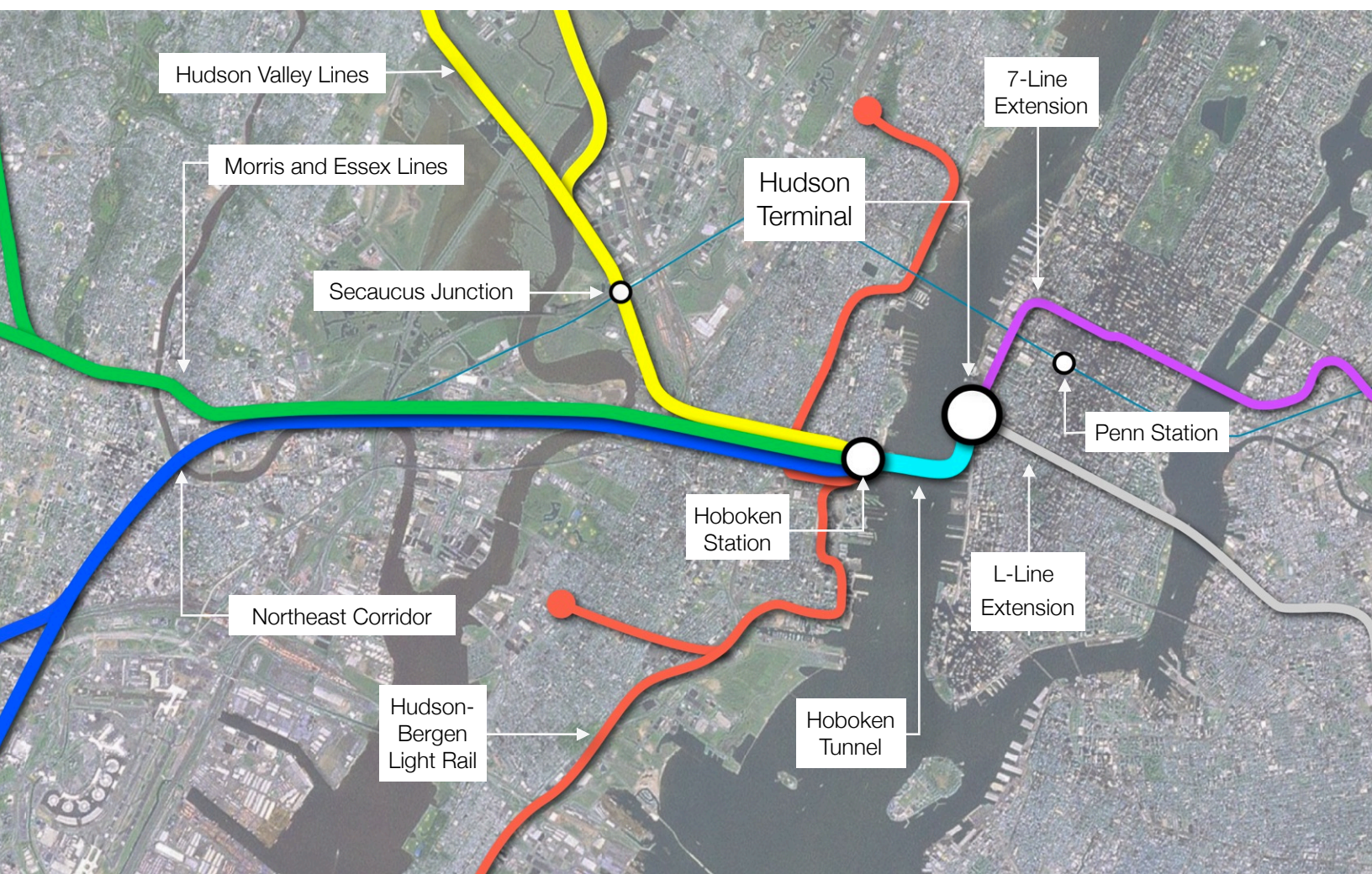


Related Companies and Oxford Properties' Hudson Yards Project

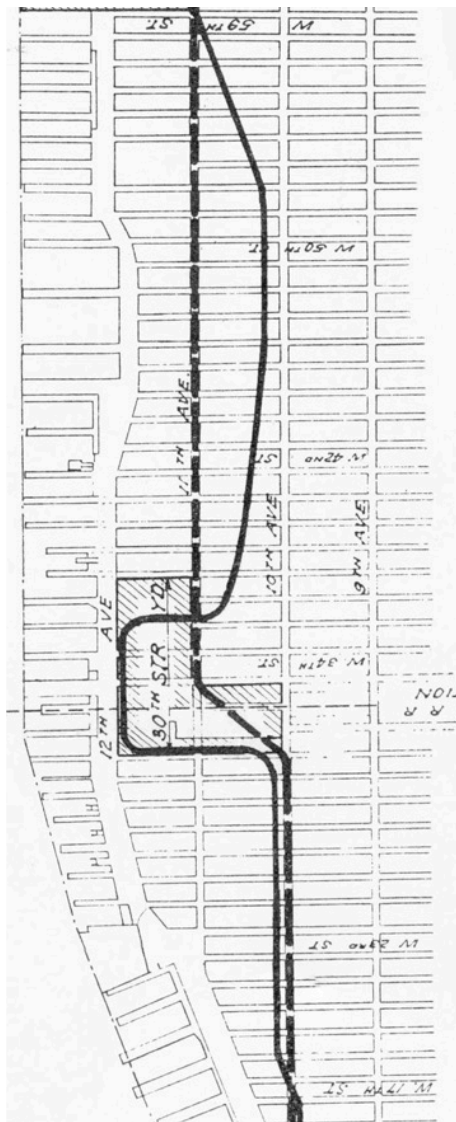
- 1) Avoid the mistakes of the past by looking forward, not just to the immediate future, but to the long-term future;
- 2) Find a way to dramatically increase track and platform capacity for trains originating west of the Hudson River;
- 3) Develop a strategy to plan for the sustained growth of untapped areas within Manhattan's West Side through strategic, transit-oriented development;
- 4) Contain costs and schedule construction aggressively so that the public does not continue to wait around as they have become so accustomed to doing; and
- 5) Restore pride in the metropolitan region's great transportation infrastructure.

In this context, REAL TRANSIT believes that the bold solution to the complex, transportation-based challenges facing the metropolitan region is to build a third transit hub in Manhattan—the new *Hudson Terminal*. Despite the practical benefits of constructing a third transit hub from city-planning, economic, and political points of view, building a new, independent Manhattan rail station has not been suggested by any of the alternative plans currently under consideration. Where some proposals suggest doubling inbound capacity by building two new tracks from Newark Penn Station to New York Penn Station, Hudson Terminal will be able to triple inbound capacity by utilizing existing trackage that already travels to the banks of the Hudson River. Not only would this proposal contain costs significantly, but it would also take advantage of the robust, yet underused NJ Transit lines traveling to Hoboken, NJ. In addition, a rail link will be made at Hoboken to allow riders on Hudson-Bergen Light Rail to terminate in New York at Hudson Terminal. In conjunction with this transit hub, mass transit lines will be extended to provide vital connections for commuters and rail travelers to Hudson Terminal, which will be located where 14th Street meets the Hudson River. Provisions will be made to allow for future integration of high-speed rail and the addition of another level of trackage in order to best prepare for the continued growth of New York City and its surrounding areas.

Great cities have always been judged by their great infrastructure, as without unified commuter rail networks or mass transit systems, a city is just a loose collection of neighborhoods. To ensure that the New York metropolitan region is able to maintain its greatness for generations to come, it is critical that the public continues to make sensible investments in comprehensive infrastructure projects such as the Hudson Terminal Plan.



Background



West Side Line Improvements (1934)

Manhattan's West Side: A History of Neglect

Often called the “last frontier” of Manhattan real estate development, the West Side between 14th and 61st Streets has not grown to the scale of the rest of midtown Manhattan for one reason: there are currently no mass transit or regional rail systems servicing the West Side. In the decades before subways, Manhattan's West Side was dominated by a street-grade freight line stretching from the northern tip of Manhattan to the current inbound entrance of the Holland Tunnel. In turn, much of the surrounding areas were industrial and Manhattan's west coast was occupied by rows of shipping piers. As the electric engine gained popularity in the early 1900s, the West Side Line was submerged between 30th and 60th streets and elevated south of 30th street onto what is now the High Line. With the rise of the automobile, New York City residents moved out of Manhattan and into the suburbs in droves, and any hopes for a West Side subway line were officially shelved with the construction of the elevated West Side “Miller” Highway. After World War II, Manhattan's West Side faced further decline as the Miller Highway went into disrepair and containerization rendered Manhattan's older shipping piers ineffectual. Finally, in 1973, in the midst of the city's wide-scale urban renewal efforts, a section of the Miller Highway collapsed. Manhattan's West Side had hit a low point. But, on the horizon, a new signal of the future of Manhattan's West Side was rising—the World Trade Center.

Along with the twin towers came Battery Park City and the razing of the Miller Highway. Over the next several decades, Manhattan's West Side saw a gradual transformation away from the industrial hinterland it once was. Neighborhoods like Hell's Kitchen and West Chelsea became popular for younger residents and start-up businesses. The meat-houses of the Meatpacking District became posh lounges and restau-

rants. The once-booming Chelsea Piers, after falling into disrepair, was revived as a one-stop entertainment and sports complex. And in the last decade, Manhattan's West Side has seen the development of Hudson River Park and the High Line, resulting in an influx of new office and residential buildings. However, the most significant changes to Manhattan's West Side are still on the drawing board.

West Side Development Zones

In total, the neighborhoods from 14th Street to 61st Street, from 8th Avenue to the Hudson River account for a resident population of approximately 100,000 people. However, Manhattan's West Side also includes three out of the top ten fastest-growing neighborhoods in New York City. Over the next decade, developers anticipate tens of millions of square feet of commercial, residential, retail, and hotel space being added to the area in a number of key development zones.

Riverside South

The area surrounding the former Penn Central rail yards has already become a booming residential neighborhood. However, several of the original plots of land over these rail yards remain undeveloped. From 57th to 61st Street, developers are planning to construct the *Riverside Center*, a mixed-use development of 2,500 apartments, 210,000 sq. ft. of retail space, a hotel, and a 3.4 acre park. The West Side Line, which carries Amtrak routes from Penn Station to points north of the city along Metro North's Hudson Line, also runs under the Riverside South neighborhood. Metro North is currently assessing whether to provide connections between the Hudson Line and Penn Station along the West Side Line, and if so, have suggested constructing an intermediate station somewhere within the Riverside South neighborhood around 59th Street.

Midtown West

Over the past decade, the concentration of overall new development in Midtown West has been unparalleled elsewhere in the city. Midtown West office building sales rose from \$1.8 billion in 2010 to \$5.7 billion in 2011, and are predicted to continue to rise with the development of the Hudson Yards and surrounding developments.



Riverside Center (2016)

Hudson Yards

Perhaps more than any other neighborhood of New York City, Hudson Yards has the grandest plans on paper. The extension of the 7-Line to 34th Street and 11th Avenue is slated for completion in 2015. The first phase of Moynihan Station is scheduled for completion in 2016. But these projects are merely accompanying the big show: the *Hudson Yards Redevelopment Project*, which will include 24 million sq. ft. of office space, 1 million sq. ft. of retail space, and six acres of park space. The Related Companies have announced their own 12.7 million sq. ft. development, called *Hudson Yards*, which will include sixteen skyscrapers and a four acre park. The first tower, a 1,000 ft., 51-floor skyscraper connected to the High Line Park, has already signed on an anchor tenant, Coach, and broke ground in 2012. Another developer, Brookfield Properties, has announced plans for its 5.4 million sq. ft. *Manhattan West* development on 9th Avenue and 33rd Street. The five acre *Manhattan West* development will feature two mixed-use skyscrapers, the taller of the two stretching over 1,200 feet in the air.

West Chelsea

In the last several years, the area below the Hudson Yards, from 14th to 31st Street, has seen a significant rise in residential development, due in large part to the opening of the High Line. Investment in luxury residences, unique office spaces like the IAC Center, and Chelsea Piers demonstrate the area's long-term commercial investments. To that end, in 2011, Google announced that it was purchasing a 2.9 million sq. ft., full-block office building at 15th Street and 9th Avenue for its New York City headquarters. Further south, the cosmopolitan Meatpacking District has seen the conversion of Manhattan's old meatpacking houses into some of the most exclusive shops, bars, restaurants, and hotels the city has to offer.



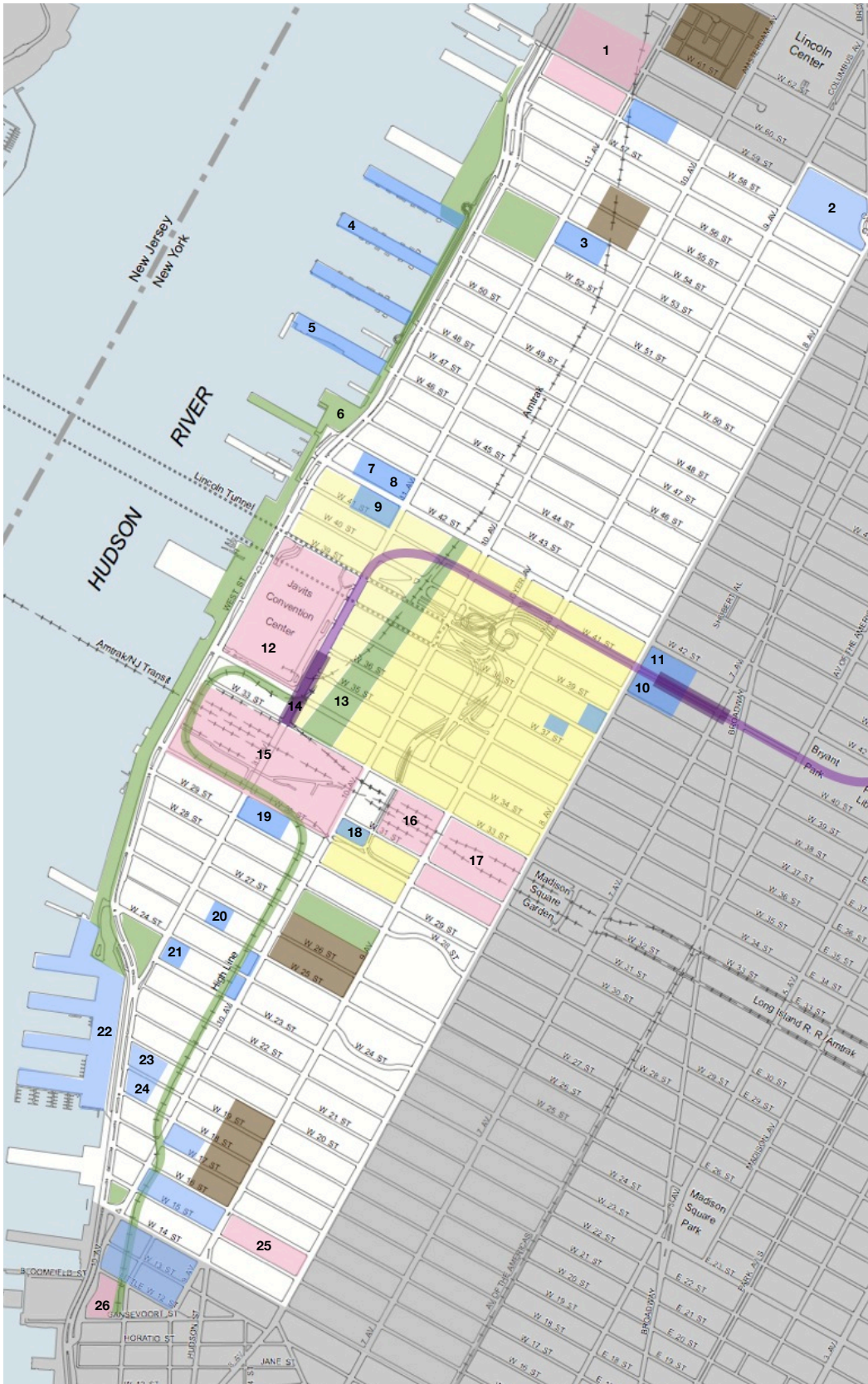
Manhattan West (2015)

Map of Selected West Side Developments

Key

- = Completed or Under Construction
- = Proposed
- = Hudson Yards Redevelopment Project
- = Public Housing
- = Parks

1. Riverside Center (2016)
2. Time Warner Center (2003)
3. Mercedes House (2012)
4. New York Passenger Ship Terminal
5. Intrepid Museum
6. Hudson River Park
7. The Atelier (2006)
8. Atelier II (2015)
9. Silver Towers (2009)
10. The New York Times Building (2007)
11. 11 Times Square (2010)
12. Javits Center Expansion/Renovation (2013)
13. Hudson Park
14. 7-Line Extension (2015)
15. Hudson Yards
16. Manhattan West (2015)
17. Moynihan Station, Phase I (2016)
18. 376 Tenth Avenue
19. OHM Apartments (2010)
20. Chelsea Arts Tower (2006)
21. 200 Eleventh Avenue (2010)
22. Chelsea Piers
23. Nouvel Chelsea (2009)
24. IAC Building (2007)
25. Google Headquarters
26. Whitney Museum (2015)



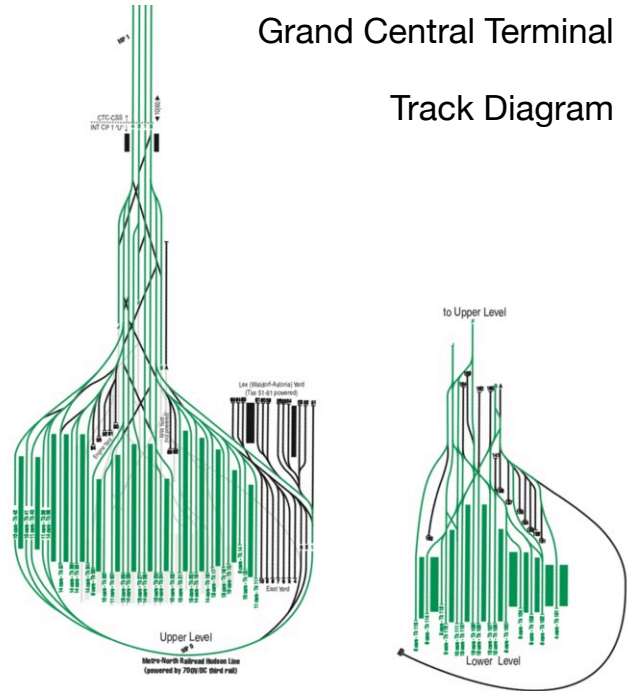
New York's Transportation Landscape

Current Regional Rail Conditions

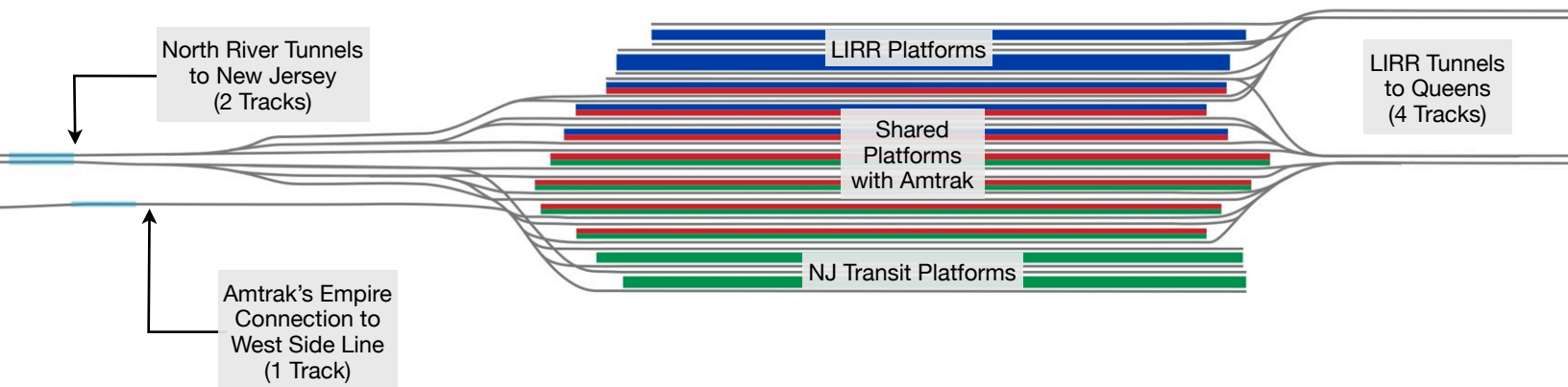
New York City enjoys one of the most diverse and dynamic transit systems on the planet. From a regional perspective, four rail systems—Long Island Rail Road (LIRR), New Jersey Transit (NJ Transit), Metro North Rail Road (Metro North), and Amtrak—usher commuters and travelers into two hub stations: Penn Station and Grand Central Terminal.

Penn Station is the main transit hub servicing Manhattan's West Side and Grand Central Terminal is the main transit hub servicing Manhattan's East Side. However, compared to Grand Central Terminal, Penn Station possesses significantly less train capacity. Grand Central Terminal provides Metro North with 44 tracks over two levels, with four feeder tracks entering the terminal from points north. On the other hand, Penn Station provides NJ Transit, Amtrak, and LIRR just 21 tracks over one level. Compared to Grand Central Terminal's ratio of 44 tracks per one rail system, Penn Station has an average ratio of just 7 tracks dedicated to each of its three rail systems. Further, while LIRR uses four feeder tracks coming from Queens, NJ Transit uses just two feeder tracks traveling into Penn Station, which it shares with Amtrak along the Northeast Corridor. During peak hours, Penn Station lacks sufficient capacity to efficiently distribute the various commuter and regional rail systems among its tracks and platforms. Still, Penn Station handles twice the demand for rail traffic as Grand Central Terminal and more rail traffic than any other station in North America. The need to alleviate Penn Station's capacity constraints could not be more apparent. But Penn Station's broader challenges stretch far beyond its capacity issues.

Grand Central Terminal Track Diagram



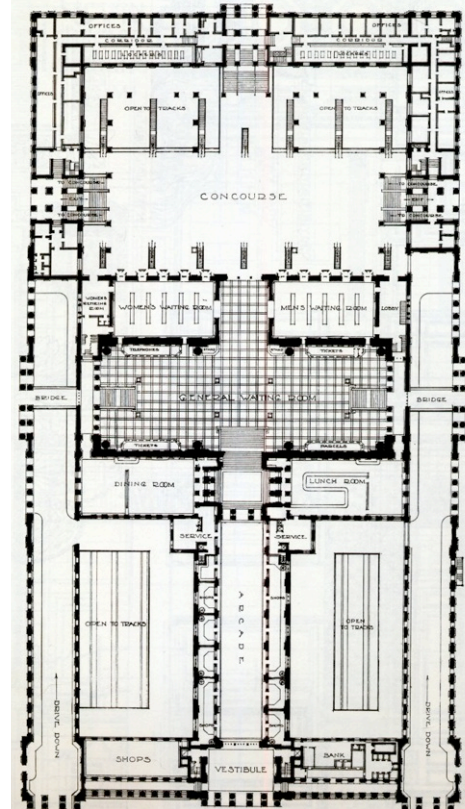
Penn Station Track Diagram



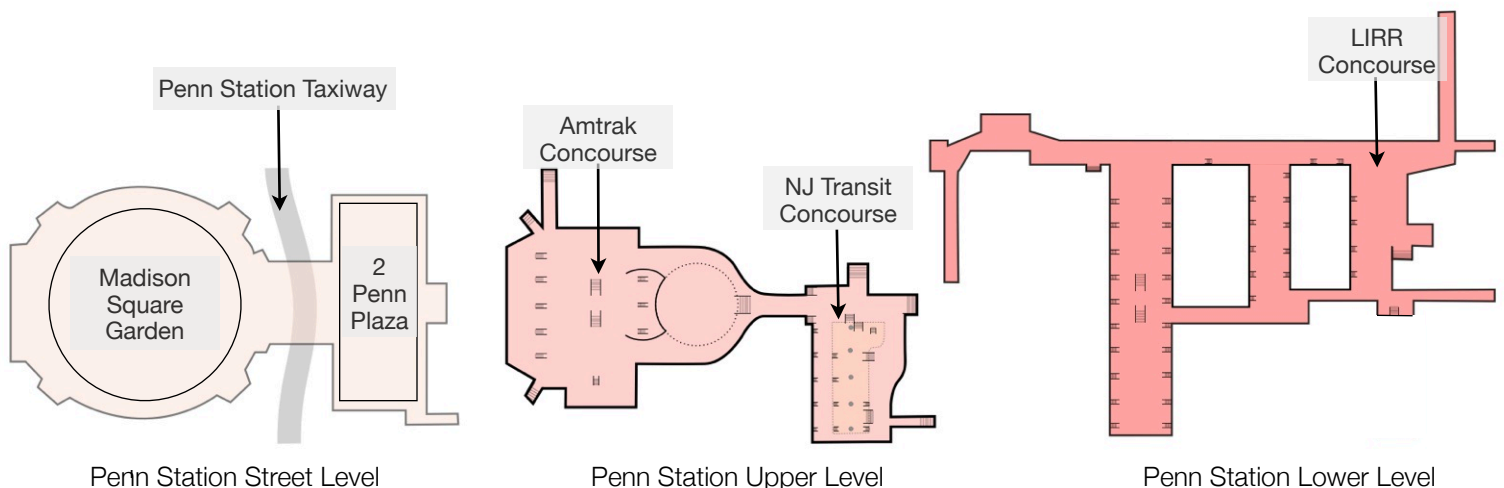
An Overview of Penn Station

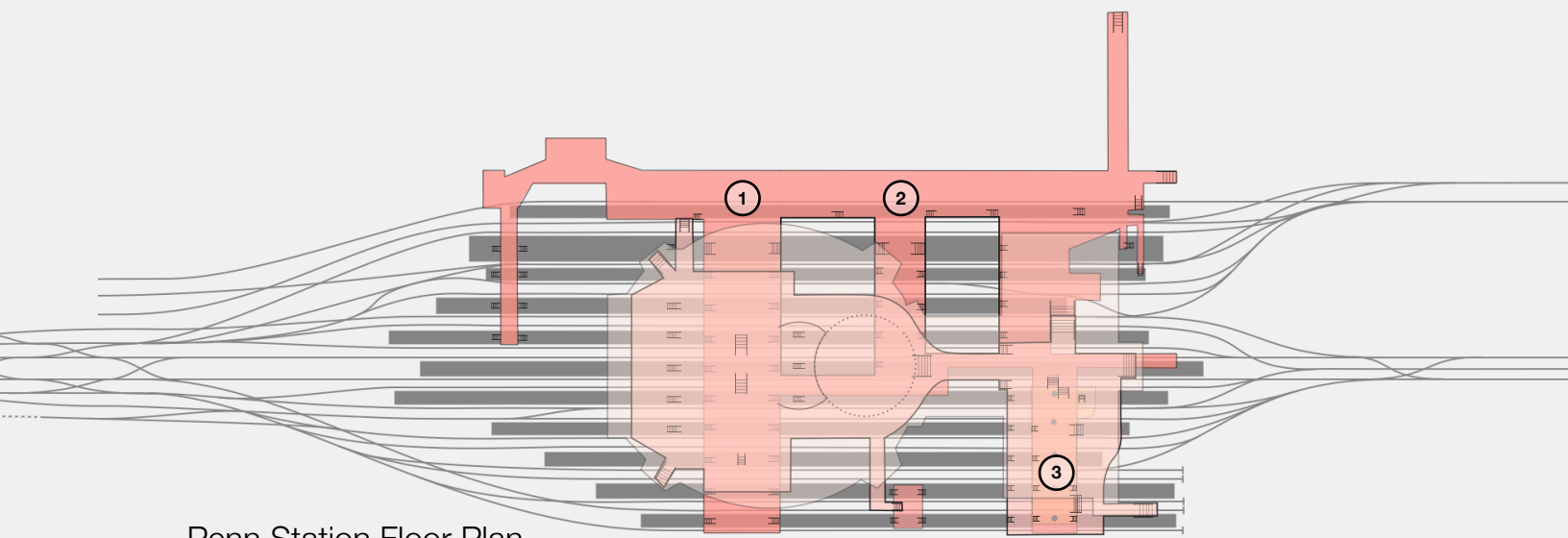
It goes without saying that Penn Station is ugly, cramped, dirty, and, some may say, depressing. But critics of reform often argue that train stations are not built to be beautiful. They are meant for traveling and commuting in the fastest and most efficient way possible. However, it is in this context that Penn Station is truly a failure. Simply put, *because of its disjointed design*, Penn Station is unable to efficiently move people between transit systems and their ultimate destinations. The ugliness happens to be the added consequence of a fundamentally flawed design. Of course, the original Penn Station (1910-1963) did not suffer from the same design deficiencies as its successor. The original Penn Station enjoyed an extra large, central waiting room with soaring ceilings and convenient connections to other sections of the station. The singular main concourse provided access to all of Penn Station's platforms from a unified location, with a vast, open floor to move freely between points.

In the 1960s, as demand for rail travel fell, Penn Station went into disrepair and critics argued that its eight acre footprint would be better used for other purposes. Accordingly, from 1963 to 1968, the original structure was razed and Madison Square Garden and Penn Plaza were built above it, relegating Penn Station to the basement levels of the complex. Over time, Penn Station, which used to exclusively serve the Pennsylvania Railroad, was sectioned off for three different rail operators: Amtrak, NJ Transit, and LIRR. Of course, three separate train systems occupying a space of the same size meant that each system had less space to work with. Instead of having a unified central concourse serving all trains, today, each section of the station is maintained and styled differently by its respective operator. As shown by the track diagram on the previous page, Tracks 1-4 are used exclusively by NJ Transit and Tracks 5-12 are shared by Amtrak and NJ Transit trains. LIRR has the exclusive use of Tracks 17-21 on the north side of the station and shares Tracks 13-16 with Amtrak. Except for the shared platforms, a passenger cannot reach the LIRR tracks directly from the Amtrak and NJ Transit concourses. Since Amtrak and NJ Transit share tracks, passengers from a NJ Transit train can wind up in the Amtrak concourse, and vice versa. This division of space has resulted in drastically smaller concourses, fewer seating areas, and more difficult navigability throughout the station.



Original Penn Station Floor Plan (Upper Level)





Penn Station Floor Plan

In addition to its design troubles, Penn Station also suffers from dual-capacity problems: 1) for points west of New York City, there is only one inbound track and one outbound track; and 2) for three transit systems, there are only 21 tracks available at a given time. This lack of capacity greatly reduces the time in which a given train may idle, i.e., trains are only able to park at a given platform for a very short amount of time before having to clear the way for the next arriving train. To avoid potential backups, track assignments are made as they become available, forcing commuters to wait until minutes before departure time in order to board their train. Further, each train system is forced to use only certain tracks within the station. With small, disjointed concourses, during peak operating hours Penn Station becomes a center for angry, gridlocked commuters. Passengers are forced to stand because there is not enough room for adequate seating. This breakdown of passenger movement makes boarding the overcrowded trains even more time-consuming, causing further delays in departures and subsequent arrivals in and out of the already at-capacity tunnels, and setting off a chain reaction across all three transit systems.

Despite the chaotic transit dance that occurs every rush hour in Penn Station, NJ Transit still claims an on-time performance rate of 91% along the Northeast Corridor. This apparent anomaly, however, is the result of dubious accounting—a train is counted as “on-time” even if it arrives up to six minutes later than its posted arrival time. For shorter routes, a train could take 20% or more time than posted and still be counted on-time. Since the entire system suffers for every minute that a train is delayed, having trains arrive consistently late while still being counted as “on-time” not only hurts rail passengers, but also misrepresents the full extent of the problem.



Exit Concourse, Lower Level



Central Corridor, Lower Level



NJ Transit Concourse, Upper Level



Penn Station Delays Strand Commuters in the Cold

Jan. 24, 2011 - Wall Street Journal

On a frigid Monday night, Metropolitan Transportation Authority police kept thousands of commuters out of Penn Station after a disabled train caused delays.

Once delays last longer than about 15 minutes, Penn Station can get dangerously crowded. When that happens, the railroads that operate there set up barriers outside to prevent more commuters from entering the station.

Delays started around 5 p.m. Monday when a Long Island Railroad train bound for New York from Babylon got stuck near the end of a platform at Penn Station. That train was blocking the way for other trains to get to one of the LIRR's East River tunnels, leading to the big delays.

The train was moved shortly after 6 p.m., an LIRR spokesman said, and commuters were allowed back into Penn. New Jersey Transit wasn't affected by the delays, and Penn Station entrances to access New Jersey-bound trains remained open.

Where There Are Identifiable Problems, There Are Workable Solutions

For starters, Penn Station needs a **unified, central concourse** providing access to all platforms from the same location. The closest thing to a unified concourse that Penn Station currently offers is the Exit Concourse, which, as the name implies, is meant to provide the efficient *dispersal* of arriving passengers. However, the Exit Concourse is not without its own deficiencies. To begin, since the Exit Concourse is not centrally located, it is not accessible from the NJ Transit concourse. Getting to the Exit Concourse takes a map, some walking shoes, and a few staircases. However, once you have reached the Exit Concourse, you cannot see beyond the platform or two directly in front of you due to the barrage of infringing support columns (one of the downsides of locating a major transit hub beneath a sports arena). And if you have the fortune of arriving early to your designated platform, there is nowhere to sit, no place to eat, and no shopping available within the Exit Concourse.

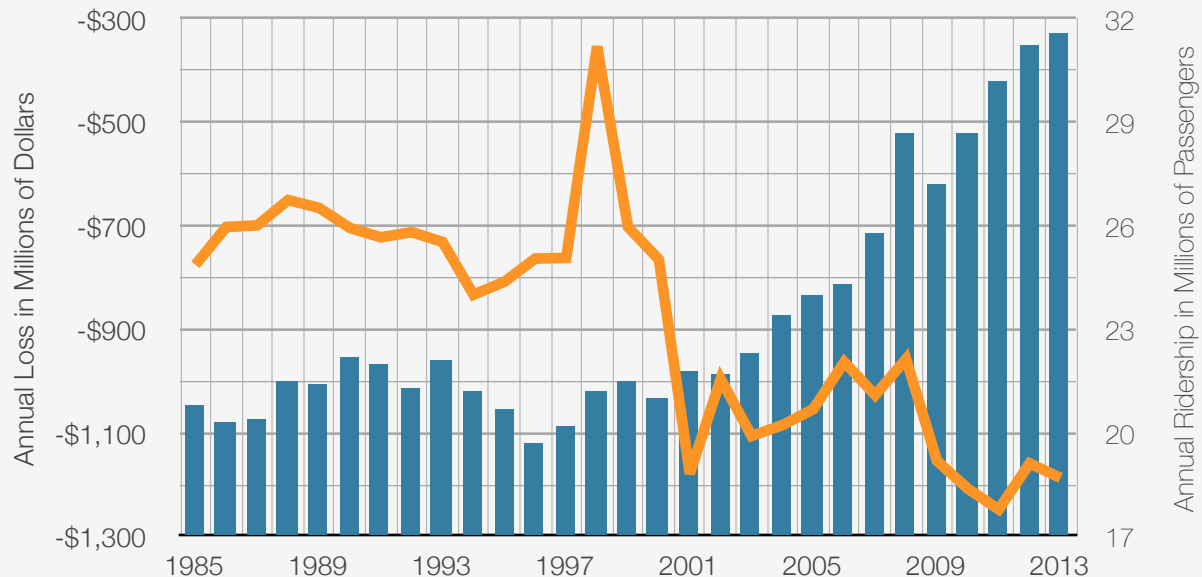
Penn Station also desperately needs **open air spaces**. When capacity is tight, one of the few comforts that could ease the ubiquitous claustrophobia within Penn Station is a high-ceilinged room with natural sunlight. From a floor plan perspective, Penn Station dwarfs Grand Central Terminal in terms of total square footage. However, because of its soaring ceilings and open concourses, Grand Central Terminal appears to be much more expansive and provides a more enjoyable travel experience. Any new construction on rail facilities within New York City that involves passenger movement should require the inclusion of cavernous spaces, which would ensure that commuters do not feel punished every time they find themselves waiting for a train.

From an oversight perspective, Penn Station also needs to **reform the bureaucratic and political hierarchy** in its operation and financing. Penn Station and its tracks are owned outright by Amtrak, which is operated and financed by the federal government. The members of Amtrak's board of directors are appointed by the President of the United States and are subject to confirmation by the United States Senate. NJ Transit and LIRR, on the other hand, are operated and financed by their respective state governments. NJ Transit is funded and governed by the State of New Jersey and LIRR is funded and governed by the MTA, a

transportation agency of the State of New York. Both NJ Transit and LIRR have entered into leasing agreements with Penn Station Leasing, LLC, a wholly-owned subsidiary of Amtrak, for the right to use both Penn Station's tracks and facilities. This means that if NJ Transit needs to expand its trackage or if LIRR needs to renovate the public areas around its main concourse, it must get express approval from Amtrak. However, unlike NJ Transit and LIRR, who depend on Penn Station to fuel the transit systems of their respective states, to Amtrak, Penn Station is one of over 500 stations it services in 46 states and Canada. LIRR and NJ Transit answer to the people of New York and New Jersey; Amtrak answers to federal government.

Amtrak Annual Loss (orange) vs. Ridership (blue)

since 1985, all routes



In terms of budgeting, Amtrak has, over the past three years, received federal subsidies averaging \$1.5 billion and has seen ridership steadily climb from around 21 million passengers in 2000 to over 31 million passengers in 2013. However, despite this apparent growth, Amtrak has operated at an average loss of over \$1.2 billion since 2009. As the chart above indicates, curiously, as Amtrak's ridership increases, its yearly operating losses continue to grow in the negative. How is it that Penn Station's owner could be so far in the red? The explanation is that despite its apparent success within Penn Station and even the Northeast Corridor, the remainder of Amtrak's operations are highly unprofitable. As a result, Amtrak looks to Penn Station as a tentpole to prop up its losses elsewhere in the country.

As Amtrak continues to lose over a billion dollars each year, NJ Transit and LIRR would be justifiably concerned that its financially unstable landlord may be pressured to squeeze additional capital out of Penn Station in order to refinance its less successful sectors. This fear was indeed realized in 2001 when Amtrak was forced to put up Penn Station as collateral for \$300 million in loan guarantees. As party politics increasingly threaten federal transportation funding, there are no assurances that Amtrak will continue to receive the vast federal subsidies upon which it relies. Amtrak may be required to raise rents, sell off transit space, or at best, just neglect to make much-needed improvements throughout the station. In order to avoid these potential problems, the operator of New York's premiere transit hub needs to have both unified interests with the passengers it serves as well as sound financial footing.

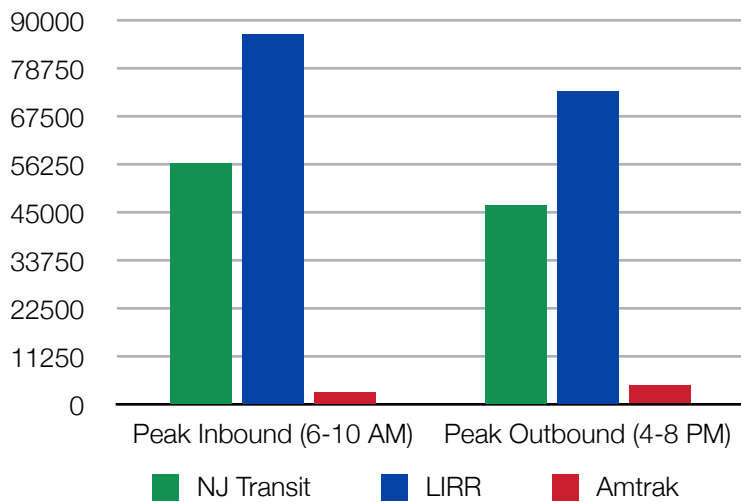
Amtrak's Fiscal Health (in millions)

	2011	2012	2013
Gross Operating Revenues	\$2,706	\$2,876	\$2,991
Gross Operating Expenses	\$3,944	\$4,035	\$4,179
Net Operating Loss	-\$1,238	-\$1,159	-\$1,188
Total Rail Ridership	30.2	31.2	31.6

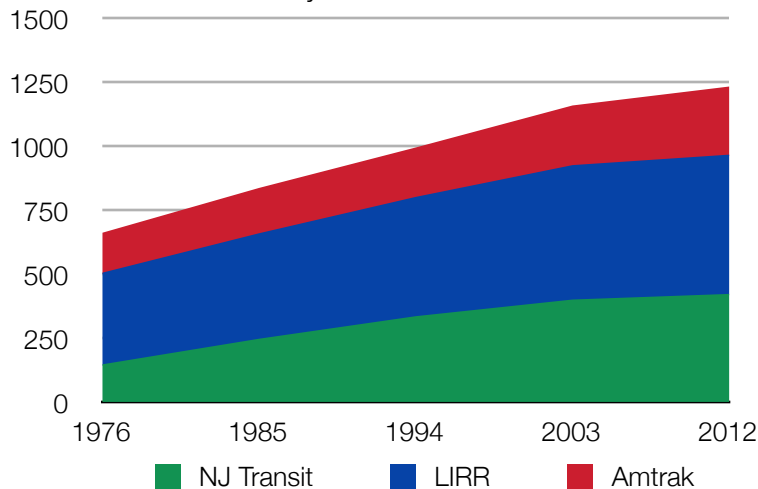
NJ Transit's Fiscal Health (in millions)

	2011	2012	2013
Gross Operating Revenues	\$943	\$960	\$946
Gross Operating Expenses	\$2,402	\$2,436	\$2,520
Net Operating Loss	-\$1,459	-\$1,476	-\$1,574
Total Rail Ridership	77.8	80.4	78.6

Penn Station Weekday Ridership by System



Total Weekday Trains to/from Penn Station



It must also be noted that Amtrak is in direct competition with NJ Transit for passengers along the Northeast Corridor (which is also owned by Amtrak and leased by NJ Transit). For instance, a person wishing to travel from Penn Station to Trenton, NJ at noon on a weekday has the option of either taking a 90 minute NJ Transit train for \$16 or a 50 minute Amtrak train for \$40. While the relationship between Amtrak and NJ Transit is currently civil and complementary, Amtrak holds all of the cards. Further, Amtrak's monopolistic control of Penn Station is at odds with its little relative use of the rail hub; on a given weekday during peak hours, Amtrak comprises only 3% of the station's ridership. It is simply bad public policy for NJ Transit and LIRR commuters to rely upon an at-capacity station run by an unprofitable landlord who also happens to be a competitor. Competition is a good thing, but Amtrak currently has a monopoly over NJ Transit's service to Manhattan.

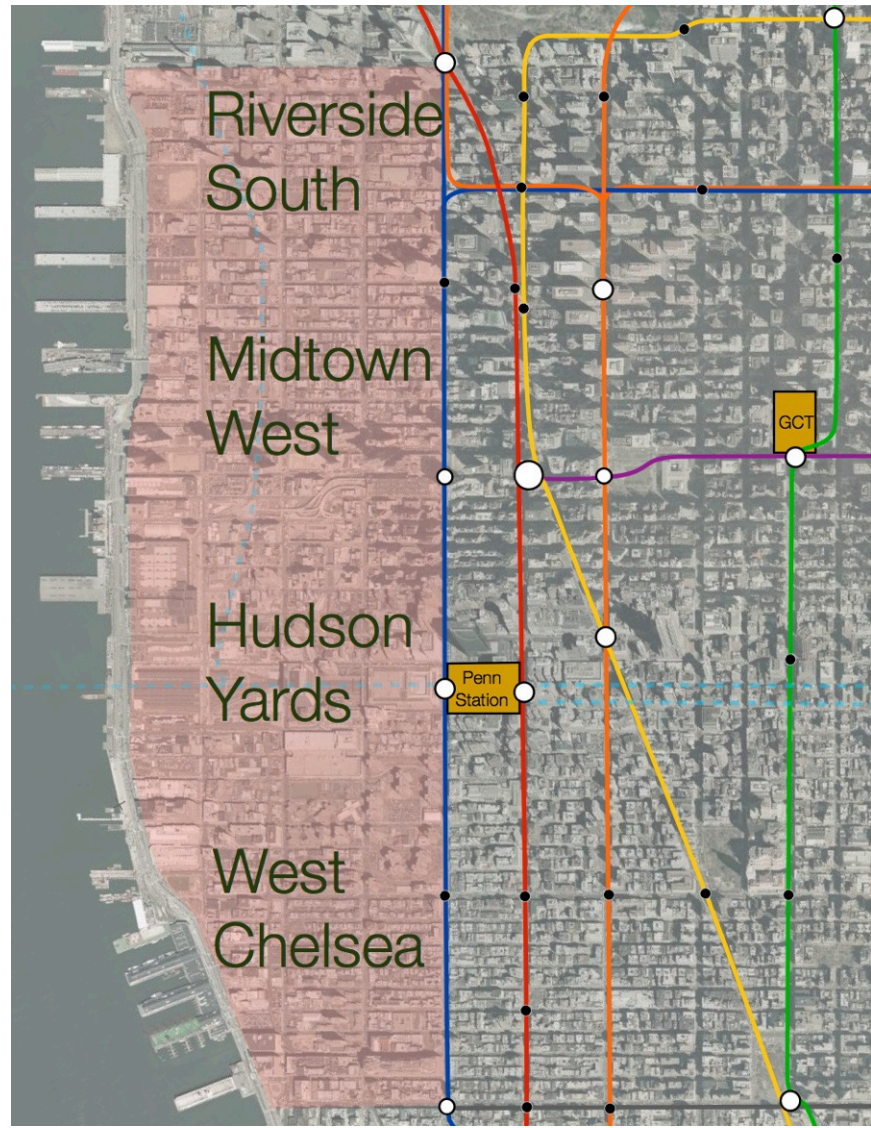
Perhaps most importantly, Penn Station needs to **drastically alleviate its capacity constraints**. This can be accomplished in one of two ways. The first way is to increase the supply of tracks and platforms within Penn Station to ease the problems associated with

overcrowding and delay. However, a minor capacity upgrade would be shortsighted and would effectively amount to "kicking the can down the road." As illustrated by the chart above, since Amtrak took control of the Northeast Corridor in 1976, the number of weekday trains in and out of Penn Station has nearly doubled. Still, there are currently no proposals that address the increases in ridership that are projected to occur over the next 35 years, likely because Penn Station would need to add a significant number of tracks and platforms to satisfy this ever-growing demand. Given Penn Station's location and space constraints, effectively doubling train capacity would prove prohibitively expensive, if not technically impossible.

The second and more effective way to improve Penn Station's capacity constraints is to reduce the demand for travel into Penn Station by allowing commuters to terminate at other stations. This idea is already being implemented for LIRR by the MTA through the East Side Access project, which seeks to reroute a number of LIRR trains into a new eight-track station below Grand Central Terminal. This will provide commuters from Long Island the option of traveling to either Penn Station or Grand Central Terminal depending upon their ultimate destination. However, both Amtrak and NJ Transit still utilize only one Manhattan terminus and one pair of tunnels to enter New York City from New Jersey. In order to responsibly and permanently address the growing demand for rail travel in the metropolitan region, **a third Manhattan transit hub must be built** to increase cross-Hudson capacity and reduce the demand for ridership into Penn Station.

Current Local Rail Conditions

There are currently five north-south subway lines and three crosstown lines running through midtown Manhattan. However, at the moment, there are no north-south or east-west subway lines providing service to the areas west of 8th avenue. By contrast, there are several subway lines that currently provide service to Manhattan's East Side. In addition, the planned Second Avenue Subway will add a new full-length, north-south line on the East Side. Provisions to correct this imbalance in mass transit options for Manhattan's West Side have begun with the construction of a one-stop, westward extension of the 7-Line to the Javits Center. However, in order for the growing West Side neighborhoods of Riverside South, Midtown West, Hudson Yards, and West Chelsea to realize their full potential, a new, full-length West Side Line needs to be constructed in the future.

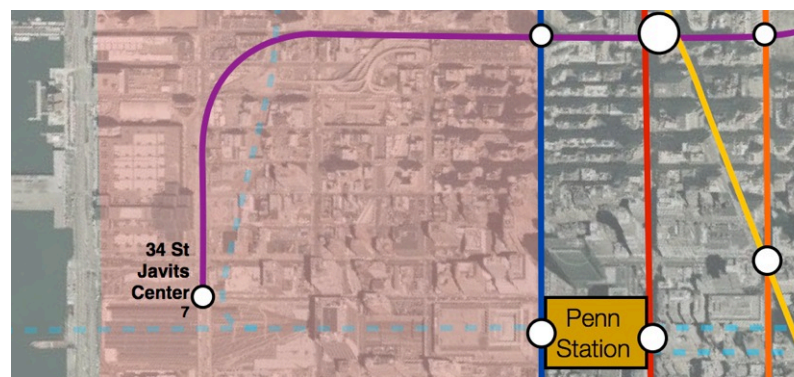


Current Conditions: West Side Local Transit

Planned Capital Improvements

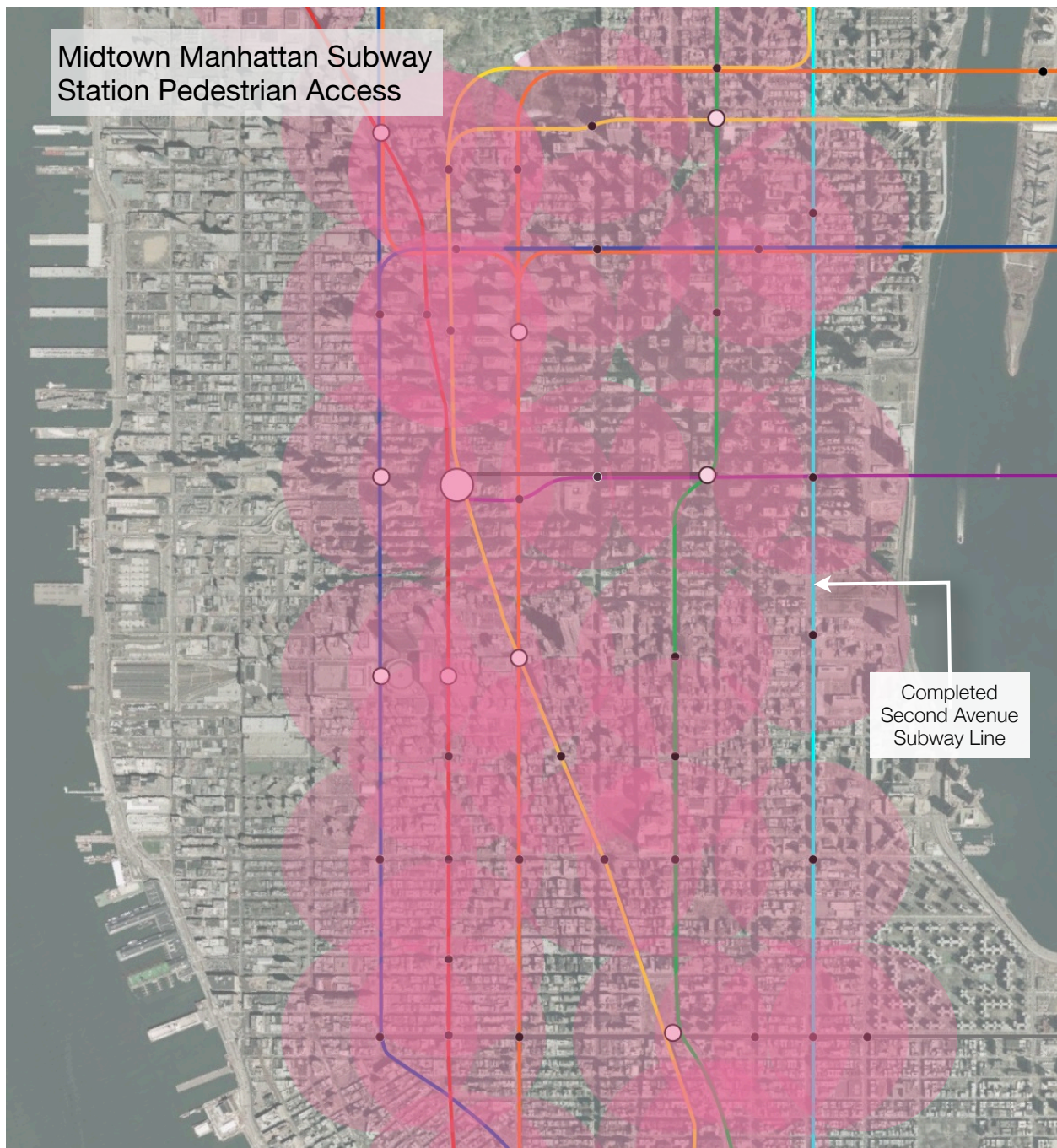
The New York metropolitan area has a number of transportation-infrastructure projects that have been in the works for decades and are slated for completion within the 2010s. These include:

- 2014** - Fulton Center
- 2015** - 7-Line Subway Extension
- 2015** - World Trade Center Transit Hub
- 2016** - Second Avenue Subway, Phase I
- 2016** - Moynihan Station, Phase I
- 2019** - East Side Access



7-Line Subway Extension

By 2019, some of the largest capital projects in New York City's history will be complete, leaving room for the next great wave of transit construction to begin. However, even after these projects are completed, there will still remain a noticeable gap in transit options to and from Manhattan's West Side. The map below illustrates this gap in service by demonstrating pedestrian access to Manhattan subway stations. Each pink circle represents a 1,500 ft. radius equivalent to a five-minute walking distance. Note how the addition of the Second Avenue Subway corrects the East Side's deficiency of mass transit options. Upon its completion, the completed Second Avenue Subway will provide workers and residents of the neighborhoods bordering the East River with access to mass transit for the first time since the demolition of the Second and Third Avenue elevated lines in the 1940s and 50s.



The Hudson Terminal Plan

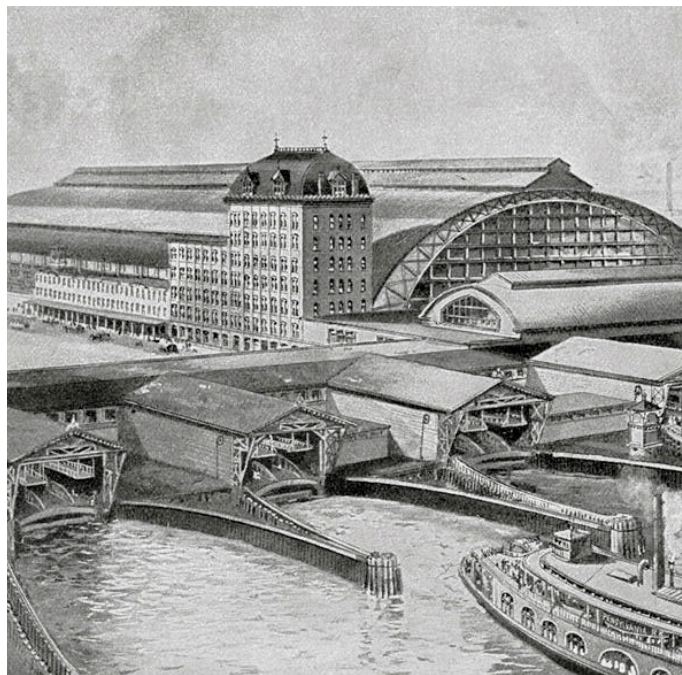
Choosing the Path to the Next Great Transit Hub

Looking only at a map of NJ Transit's rail lines, it would appear that the center of the New York metropolitan region is located in Hoboken, NJ, where the greatest number of commuter rail lines terminate. Of course, this could not be further from the truth. Hoboken has a population of 50,000 while New York City has a population of over 8 million. Nevertheless, the Hoboken transit infrastructure is built to accommodate a huge city. This is because Hoboken used to accommodate a huge city—New York City.

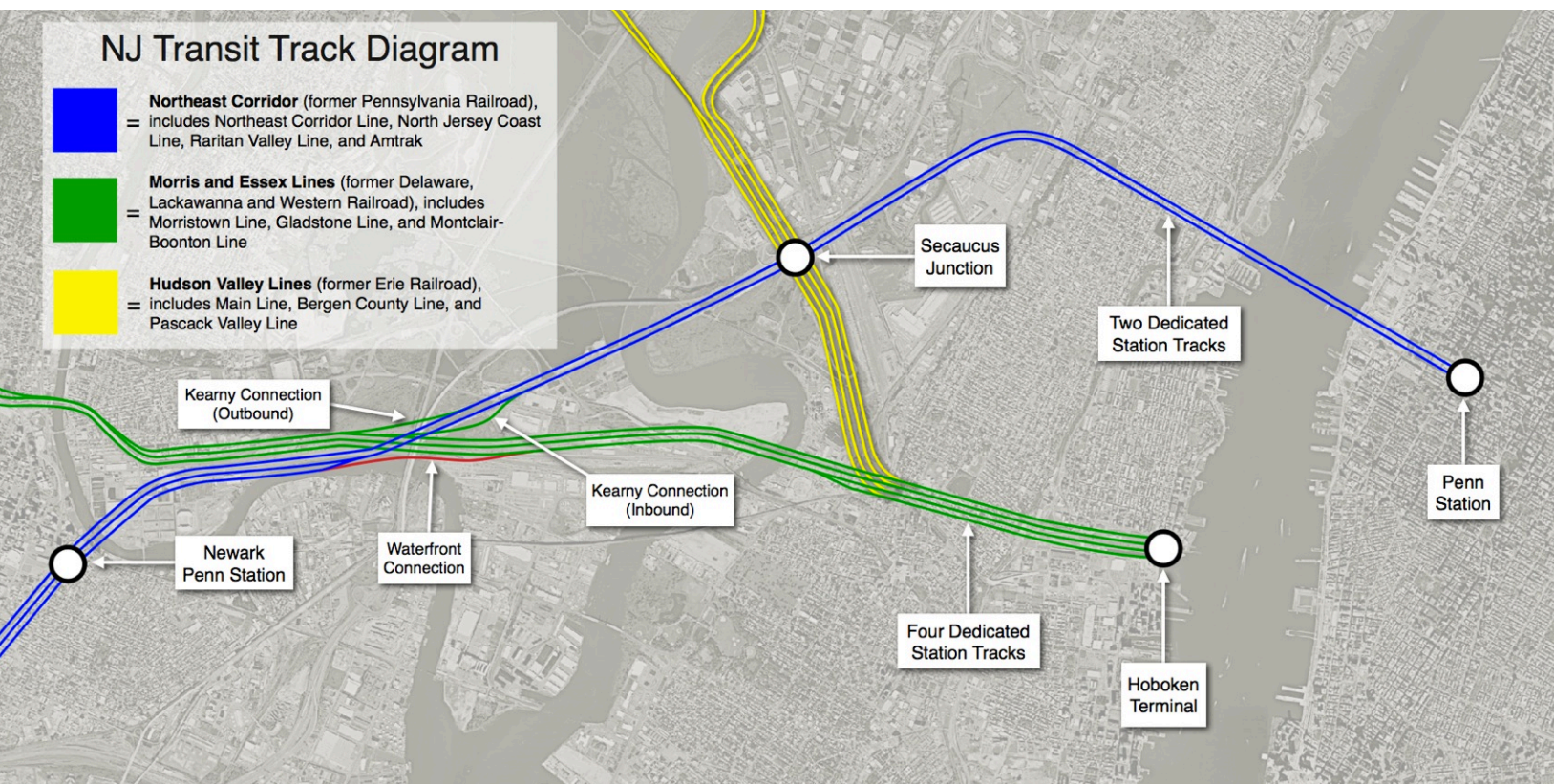
Before the advent of tunneling technology, all trains from points south and west terminated on the western banks of the Hudson River. Upon arriving at the various rail terminals, travelers would then transfer to ferries to Manhattan. The Delaware, Lackawanna and Western Railroad terminated in Hoboken at the current Beaux-Arts Hoboken Terminal. The Erie Railroad terminated directly below Hoboken Terminal by today's Newport PATH Station. Lastly, the Pennsylvania Railroad terminated below the Erie Railroad's station in Jersey City by today's Exchange Place PATH Station. In 1910, with the completion of the two single-track North River Tunnels and the opening of Penn Station, the Pennsylvania Railroad became the first west-of-the-Hudson regional rail system to travel directly into Manhattan. In the 1950s, the Erie Railroad shifted its operations to Hoboken Terminal, and by 1960, merged with the Delaware, Lackawanna and Western Railroad to form the Erie Lackawanna Railroad. By the mid-1970s, railroads across the nation were struggling and the federal government took two bold actions: 1) consolidating regional railroads including the Pennsylvania Railroad and Erie Lackawanna Railroad



NJ Transit Service Map



Pennsylvania Railroad's Jersey City Terminal



into the Conrail System; and 2) creating Amtrak to operate intercity rail systems. In 1983, the commuter rail segments of Conrail were returned to various state agencies, resulting in the formation of the current NJ Transit system in use today.

At the time of NJ Transit's creation, lines terminating at Penn Station and lines terminating at Hoboken Terminal were completely independent from one another. However, this changed with the completion of the Waterfront Connection in 1991, which provided a single track connector from the Northeast Corridor to the Morris and Essex Lines terminating in Hoboken. In addition, in 1996, NJ Transit completed the dual-track Kearny Connection, which provided trains along the Morris and Essex Lines the option of traveling directly into Penn Station. Finally, in 2003, Secaucus Junction opened to the public, allowing riders along the Hudson Valley Lines to transfer to Northeast Corridor trains bound for Penn Station.

Since the completion of the North River Tunnels in 1910, commuters along today's NJ Transit lines have, in greater and greater numbers, chose to terminate at Penn Station for obvious reason: passengers terminating in Hoboken require additional travel to arrive in Manhattan. However, despite the increased ridership along Penn Station lines, rail infrastructure in New Jersey still heavily favors travel to Hoboken Terminal. As noted by the track diagram above, Hoboken-bound trains share seven feeder tracks merging into four dedicated station tracks at the Bergen Tunnel. In contrast, trains heading to Penn Station use only two feeder tracks continuing to the two single-track North River Tunnels. At the same time, 176,000 NJ Transit riders travel through Penn Station every weekday, while only 32,000 NJ Transit riders travel through Hoboken Terminal. This means that NJ Transit trains terminating at Penn Station are limited to half the trackage for five times the daily volume as NJ Transit

Hoboken Terminal vs. Penn Station

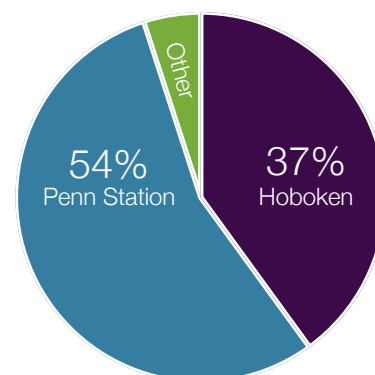
- Hoboken Terminal serves 8 distinct NJ Transit Lines; Penn Station serves only 5 distinct NJ Transit Lines.
- Hoboken Terminal is fed by 7 feeder tracks that merge into 4 dedicated station tracks; Penn Station is fed by only 2 dedicated tracks from New Jersey.
- Hoboken Terminal's NJ Transit operations may occupy 18 tracks at a given time; Penn Station's NJ Transit operations may occupy 12 tracks at a given time.
- Despite its greater rail infrastructure and capacity, Hoboken Terminal handles only 32,000 NJ Transit passenger trips per day compared to Penn Station's 176,000 NJ Transit passenger trips per day.

	Number of Daily One-Seat Trips (Weekdays)			
	Inbound Hoboken	Inbound Penn Station	Outbound Hoboken	Outbound Penn Station
Main Line	24	0	22	0
Bergen County / Port Jervis Line	34	0	35	0
Pascack Valley Line	19	0	21	0
Montclair-Boonton Line	18	21	20	21
Morristown Line	27	55	30	58
Gladstone Line	21	2	23	2
Raritan Valley Line	1	5	0	5
Northeast Corridor Line	0	97	0	96
North Jersey Coast Line	5	39	5	38
Total NJ Transit	149	219	156	220

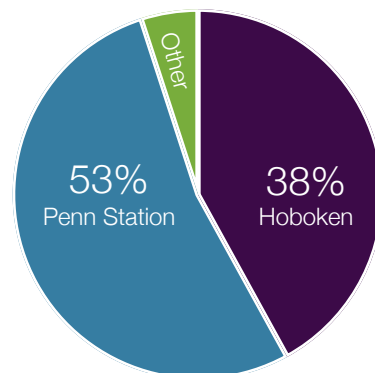
trains terminating at Hoboken Terminal. This results in overcrowding, not only within trains, but on platforms and at stations throughout the system. Some proposals have suggested doubling the cross-Hudson capacity into Penn Station to four tracks. However, even then, Penn Station would still serve two and a half times more trains per inbound track than Hoboken Terminal.

Considering the cost, the solution is not to increase the supply, but rather to reduce *demand* for trains traveling to and from Penn Station by increasing demand elsewhere in the system. Thus, it seems natural to do what engineers would have done when tracks were first laid to Hoboken over 100 years ago—extend the four inbound tracks from Hoboken to New York City. Not only would this be a better use of current resources because of the existing rail infrastructure feeding into Hoboken Terminal, but it would also triple cross-Hudson rail capacity (by adding four new tracks) as opposed to merely doubling it (by adding two tracks to Penn Station). In addition, plans attempting to alleviate overcrowding in Penn Station by merely increasing train capacity therein would require a significant increase in NJ Transit service to Penn Station, in turn requiring the purchase of new rolling stock, expansion of existing rail yard capacity, and increase in NJ Transit's annual operations budget, which already suffers from severe deficits. On the other hand, Hoboken Terminal, despite handling 80% fewer passengers than Penn Station each day, still receives just 30% fewer daily trains, as noted by the charts above. Put another way, Hoboken receives nearly 40% of NJ Transit's trains for 18% of NJ Transit's passengers. By simply shifting existing resources, as opposed to using new resources, an extension of the tracks from Hoboken to a new terminal in Manhattan will capitalize on the robust, yet underused, commuter service terminating at Hoboken Terminal.

Daily Inbound One-Seat Trips
(by terminus)



Daily Outbound One-Seat Trips
(by terminus)



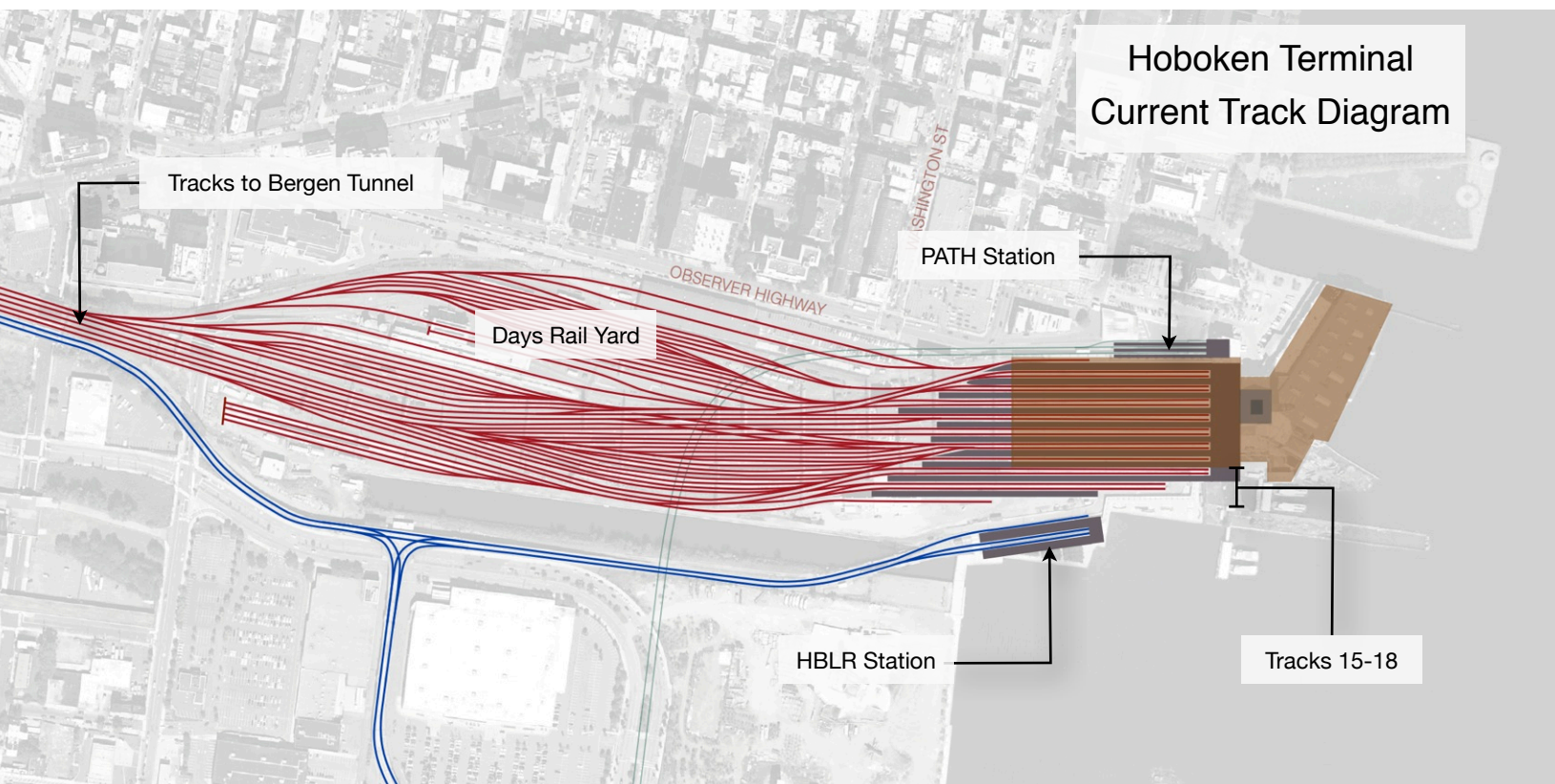
Hoboken Terminal

Hoboken Terminal's four main tracks lead into two train yards and ten platforms serving 18 tracks for passenger service. There are also connections to the Hoboken PATH and Hudson-Bergen Light Rail ("HBLR") stations, which are served by independent tracks. Adjacent to the platforms sits the Hoboken Terminal main waiting room, a Beaux-Arts landmark completed in 1908. To extend four tracks from Hoboken Terminal to New York City, some of the tracks, platforms, and surrounding buildings would have to be razed. However, the arrangement of Hoboken Terminal and its buildings would allow construction to proceed all while maintaining existing rail operations. Whereas most passenger trains and the Hoboken Terminal main



Hoboken Terminal Main Waiting Room

waiting room reside on the north side, from Tracks 1 to 14, tunneling and construction of new platforms would occur on the south side of the terminal. Tracks 15 to 18, and their surrounding structures, will be razed and new platforms, tracks, and tunnels will be constructed in their place. With the exception of the Hoboken HBLR station, located several hundred feet from Hoboken Terminal's main waiting room, most of the south side of Hoboken Terminal is unused or occupied by deteriorating structures and abandoned piers. The PATH Station, HBLR Station, Hoboken Ferry Terminal, and 14 of 18 existing tracks will remain open for passenger service during the construction of new tracks, tunnels, and platforms.



Current Conditions: South Side of Hoboken Terminal



Tracks 17 and 18



Hoboken Terminal Waterfront



Abandoned Pier Foundations



Rusted and Deteriorating Structures



Temporary Buildings



Unused Open Spaces

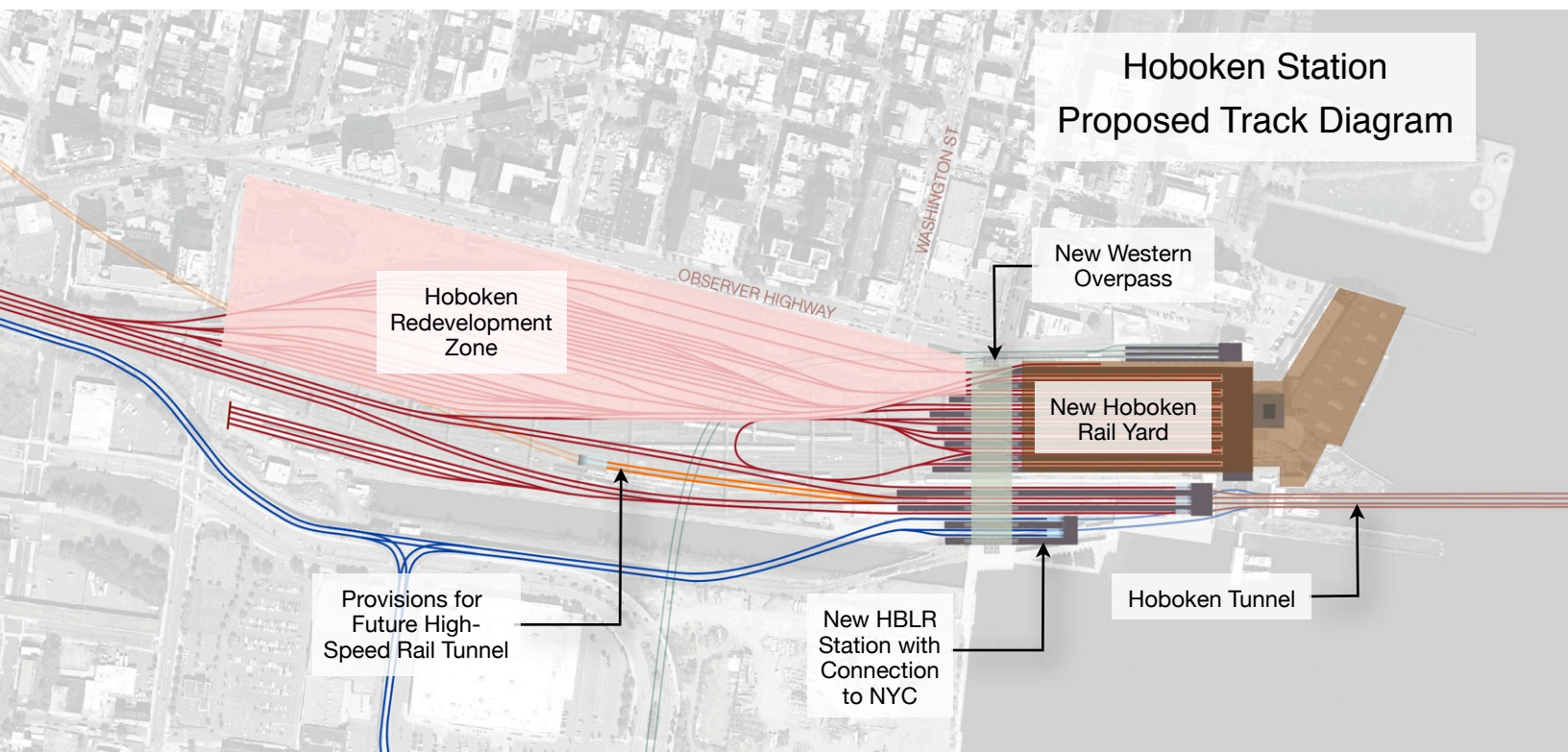
Hoboken Station Redevelopment

Extending the four main tracks to New York City would transform Hoboken Terminal into Hoboken Station. Existing platforms and tracks will become the new Hoboken Rail Yard for storing NJ Transit trains. From Bergen Tunnel, four inbound tracks will arrive at two high-level, island platforms. Two exterior tracks will accommodate local NJ Transit service, while the two interior tracks will accommodate express NJ Transit service and Amtrak. The inner two tracks will also connect to a future high-speed rail line that would utilize both Hoboken Station and Hoboken Tunnel. Provisions will be made for a dedicated tunnel on the western end of the station to provide connectivity to a new right-of-way for Amtrak's high-speed rail network. In addition to commuter rail, the Hoboken Station Redevelopment will also include the reconstruction of the Hoboken HBLR Station with a connection to Hoboken Tunnel. This new HBLR connection will provide residents of Bayonne and Weehawken a one-seat ride into New York City and will supply residents of Hoboken and Jersey City yet another route into Manhattan.

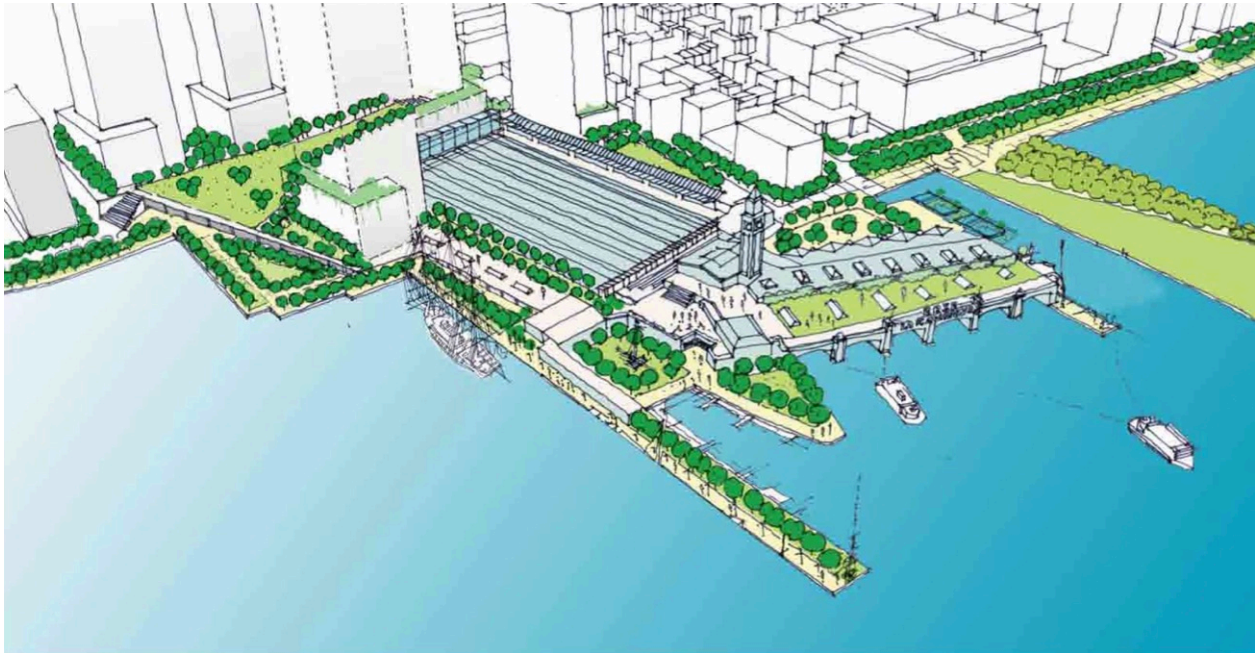


Proposed Development at Hudson Place

As trains depart Hoboken Station en route to Manhattan, tracks will gradually submerge beneath a unified platform before arriving at the entrance to Hoboken Tunnel. This will ensure that trains sustain minimum grade decreases while simultaneously providing unified access between the two new platforms, the new Hoboken HBLR Station, Hoboken ferry service, and the existing Hoboken Station structures. In addition to construction of new platforms and demolition of existing structures, Hoboken Station will also include the construction of a new Western Overpass to allow additional pedestrian accessibility to the City of Hoboken, NJ Transit Bus, and the Hoboken PATH Station. The estimated cost of the Hoboken Station improvements is \$450 million.



In addition to the improvement and redevelopment of the rail station, the construction of new tracks and tunnels will coincide with the long-delayed Hoboken Redevelopment Plan. The most recent iteration of this plan seeks to preserve and enhance the quality of life in Hoboken through smart growth and transit-oriented development. The plan also calls for the intense development and rezoning of the areas in the immediate vicinity of Hoboken Station as well as the transformation of Observer Highway into a mixed-use boulevard. New office zoning in close proximity to the station will allow for the establishment of a modern commercial district in downtown Hoboken, while residential zoning along Observer Highway will support the influx of workers and commuters into the surrounding areas. The Hoboken Redevelopment Plan complements the transformation of Hoboken Terminal into Hoboken Station by providing a balanced proposal for the sustained, responsible growth of the region.



Aerial Rendering of Open Spaces in the Station Area

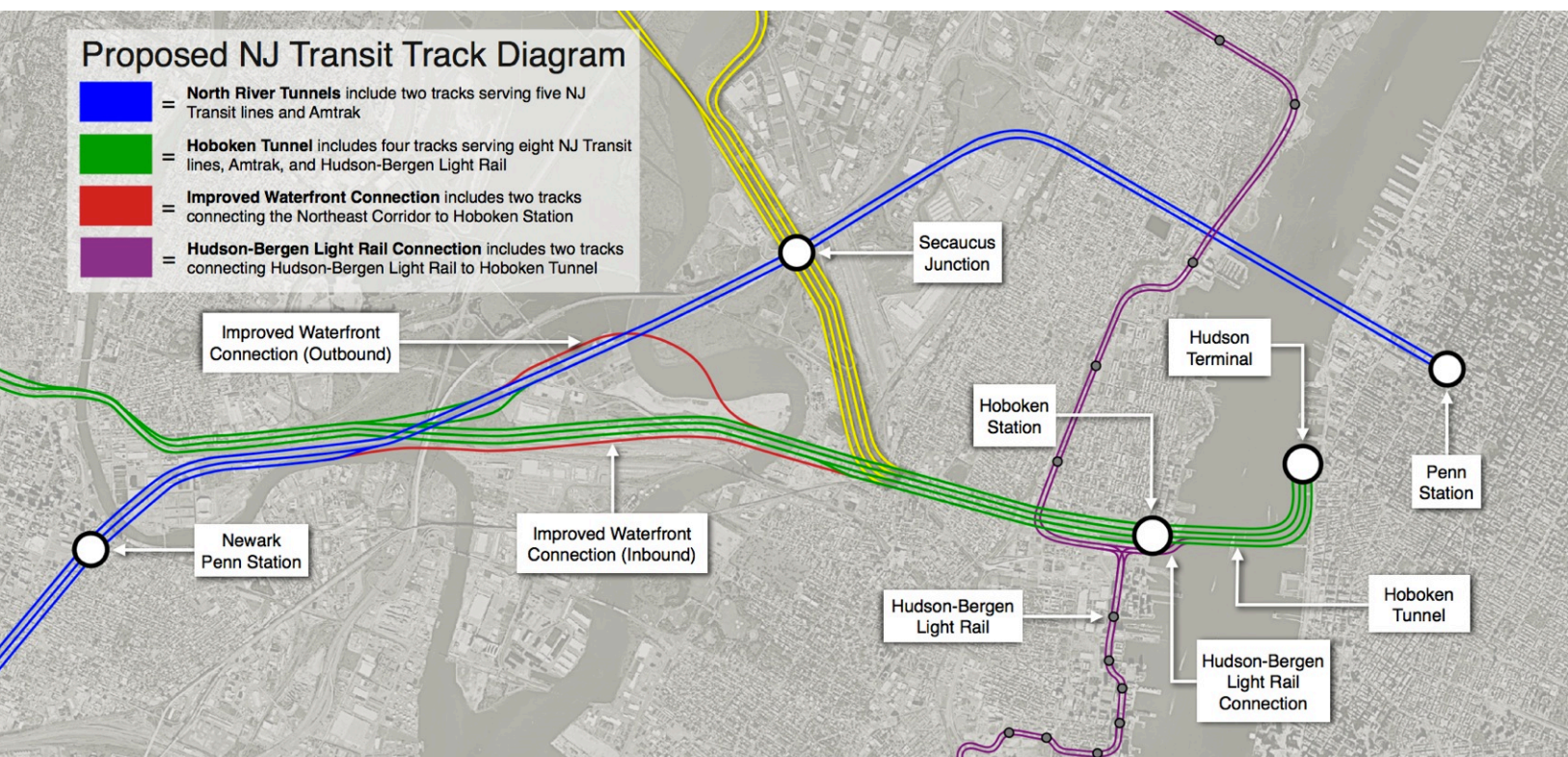


Proposed Office Towers Adjacent to Hoboken Station

The New Hudson Terminal

From the western banks of the Hudson River, the new four-track, dual-level Hoboken Tunnel will travel westward from Hoboken towards Manhattan. As the tunnel approaches Manhattan, the four tracks will curve northwards, traveling along the western coast before arriving at a new, premiere transit destination on the Hudson River—Hudson Terminal. Located at the intersection of 14th Street, 11th Avenue, and the Hudson River, Hudson Terminal will accommodate 26 tracks across 13 platforms. The tracks would be used chiefly by NJ Transit, increasing its Manhattan train capacity by nearly 400%. Hudson Terminal would also allow connections to Amtrak and the Northeast Corridor by way of an improved, dual-track Waterfront Connection. There already exists a single track connecting the Northeast Corridor to the Bergen Tunnel, which is currently used by trains originating at Bay Head on the North Jersey Coast Line as well as a single inbound Raritan Valley Line train. In order to maximize connectivity, a second Waterfront Connection track would be constructed to allow NJ Transit's Newark Division trains to enter regular service to Hudson Terminal. Further, Hudson Terminal will offer the only one-seat ride from Manhattan to MetLife Stadium, the IZOD Center, Meadowlands Raceway, and the future Xanadu shopping and entertainment complex via the Meadowlands Line. Hudson Terminal will triple the number of cross-Hudson trains into New York City, greatly increasing transit accessibility throughout the metropolitan region.

In addition to conventional rail, Hudson Terminal will also be accessible to Hudson-Bergen Light Rail via a dual track connection at Hoboken Station. Over the past decade, ridership on Hudson-Bergen Light Rail has grown faster than any other mode of public transit in the region, increasing from 3.1 million passengers in 2002 to 13.3 million passengers in 2012. With a new Hudson-Bergen Light Rail Connection, Hudson Terminal will shorten the trip to Manhattan for the nearly 50,000 daily passengers who use Hudson-Bergen Light Rail every weekday. Finally, Hudson Terminal will have the unique advantage of being located on the Hudson River, providing ferry-riders direct pier-to-rail and pier-to-subway access for the first time in midtown Manhattan.



Hoboken Tunnel

Two central goals that every new construction project should aim to achieve are maximizing efficiency and minimizing the estimated cost of construction. Thus, for Hudson Terminal, instead of boring two single-track tunnels beneath the Hudson River, as was done with both the North River Tunnels and PATH Tunnels in the early 1900s, Hoboken Tunnel will consist of a single four-track tunnel running from Hoboken, NJ to the banks of the Hudson River on Manhattan's West Side. The engineering techniques used in the construction of the 63rd Street Tunnel, completed in 1973, provide a useful model.

Because of the proximity of existing rail-Lines on the Hoboken side to the western banks of the Hudson River, construction of the tunnel will not be able to take advantage of expensive deep bore tunneling techniques. Instead, like the 63rd Street Tunnel, Hoboken Tunnel will be composed of prefabricated, two-over-two tunnel segments placed in dredged trenches in the Hudson River floor. Dredging will be accomplished by utilizing barge-mounted excavators and will allow for minimal grade fluctuations over the relatively short distance traveled. This construction technique also allows the 350 ft. x 35 ft. tunnel segments to be assembled anywhere in the world and shipped to New York to minimize costs and maximize efficiency. Once constructed, the prefabricated segments will be tugged to the respective trenches and placed from straddling catamaran barges. The Hoboken



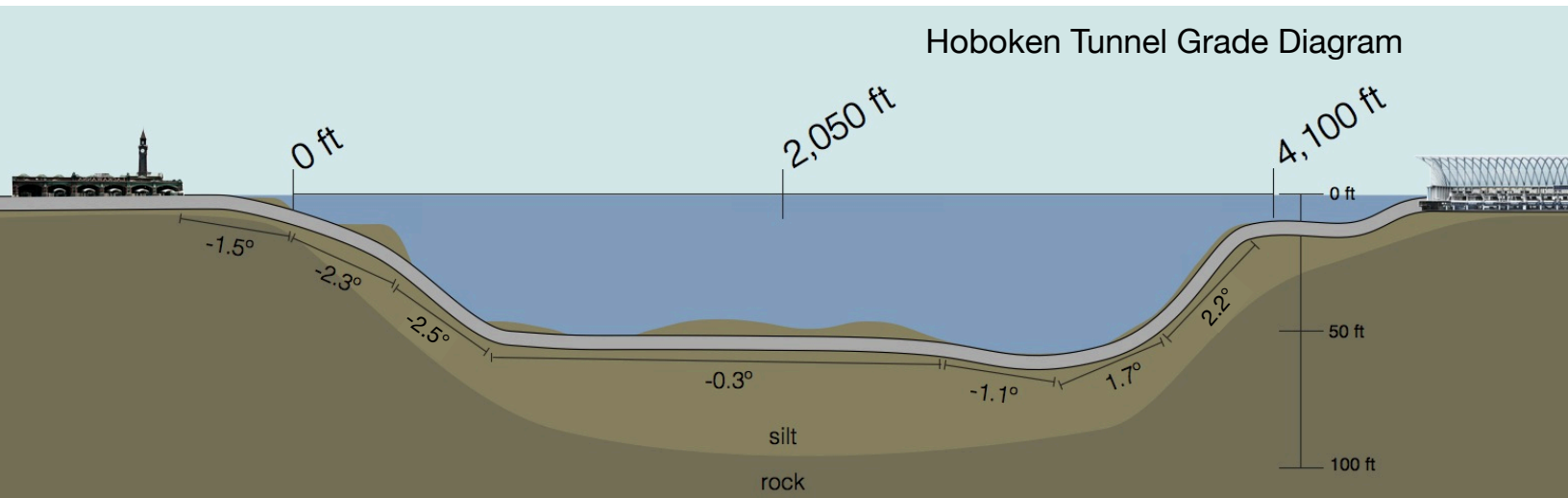
63rd Street Tunnel Section Pulled by Tugboat



63rd Street Tunnel Detail

entryway for the tunnel will be tremied into slots blasted into the rock shore. Once in place, the tunnel entrance will be accessed by traditional mining methods.

Upon its completion in 1973, the 63rd Street Tunnel cost \$69.5 million in 1969 dollars, or \$1.0 billion in 2013 dollars. At a total distance of 3,140 feet, the 63rd Street Tunnel cost approximately \$1.7 billion per mile of tunnel. Hoboken Tunnel is estimated to stretch 4,100 feet from coast to coast. Using virtually identical construction methods, and applying a 50% cost multiplier, Hoboken Tunnel is estimated to cost \$2.1 billion.



Hudson Terminal Design

Modeled after the great shipping piers that used to line the Hudson River, Hudson Terminal will honor the design of the Cunard Line slip that once welcomed the RMS Lusitania to the intersection of 14th Street and 11th Avenue. Much like the demolished Pennsylvania Railroad Jersey City Terminal, the street entrance of Hudson Terminal will lead passengers into a grand, arch-domed main concourse, which will provide unobstructed access to each of the terminal's thirteen platforms. The main concourse



RMS Lusitania Arriving at Pier 54

will stretch the entire length of the existing piers, 930 feet, with a steel and glass-laced dome towering over 200 feet high and stretching 250 feet wide (for comparison, Grand Central Terminal's main concourse is 275 feet long, 125 feet high, and 120 feet wide). At the concourse level, the main hall will be surrounded by four smaller halls, which will include ticket kiosks, automated ticketing booths, escalators and elevators to the upper and lower levels, and space for restaurants, retail, and public art. At the west end of the main concourse, a full-length glass curtain will look out onto the Hudson River and New Jersey coastline. Idling travelers will have the option of taking advantage of the terminal's waterfront location by waiting for their train on the covered terraces wrapping the perimeter of the structure. Sustainable design features will include sections of a living "green" roof, thermal mass and night ventilation to allow passive cooling to the building, natural daylight, LEED energy efficiency, and other green building techniques.

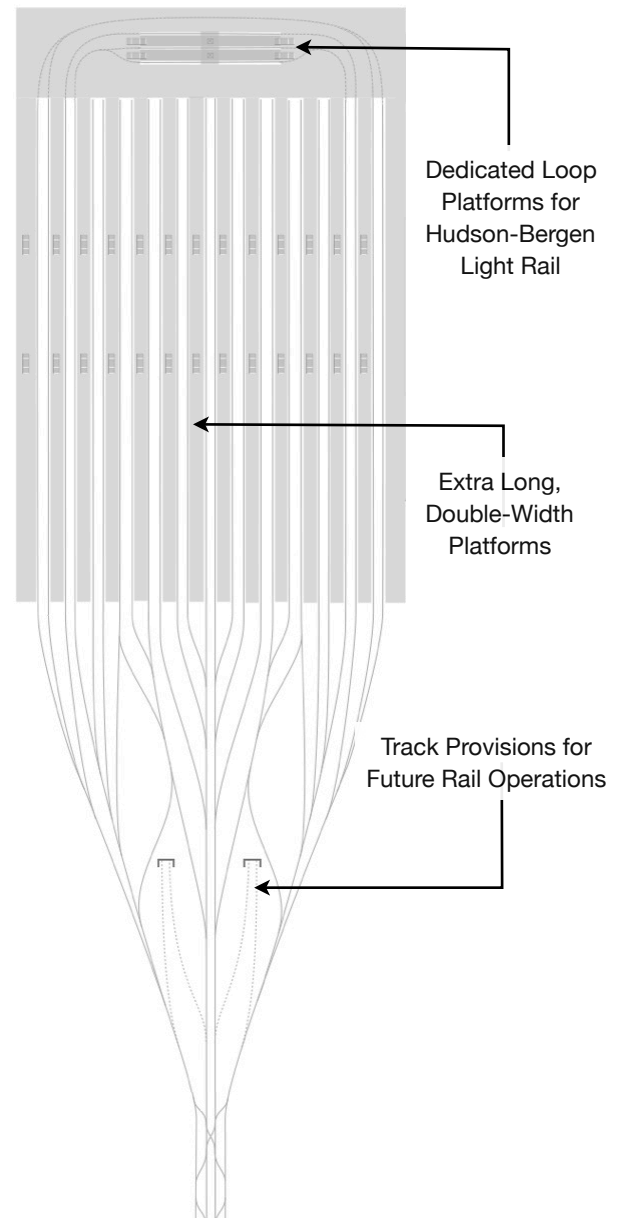


Hudson Terminal Street View

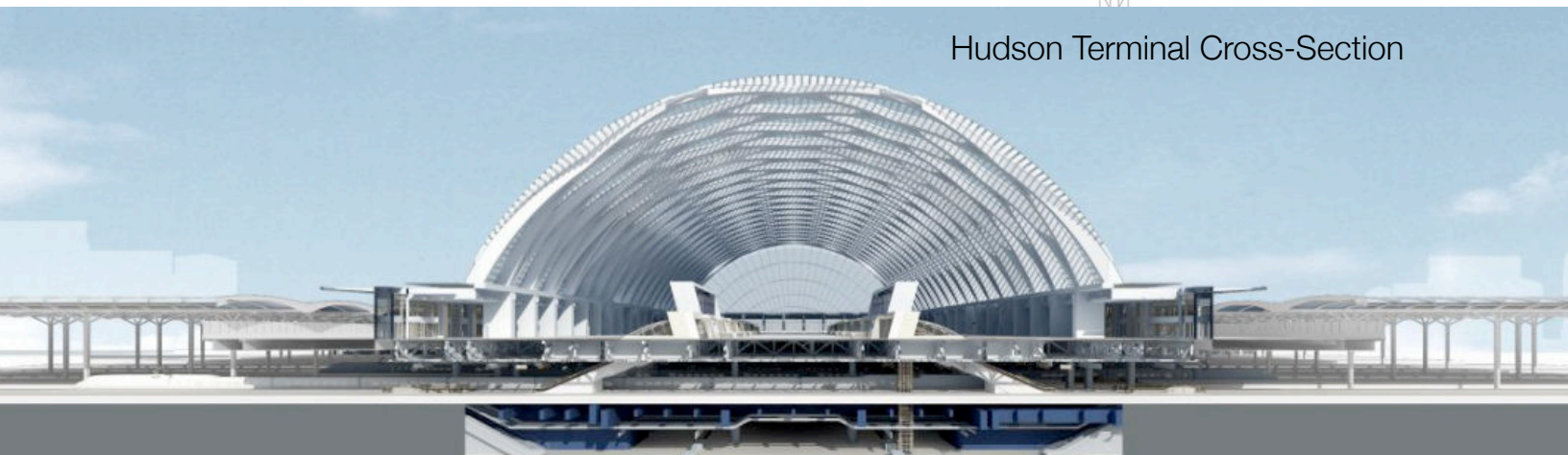
Since Hudson Terminal will be constructed on mostly reclaimed land on the Hudson River, the transit hub will enjoy the unique advantage of starting with a completely blank slate within the most densely populated city in the nation. This allows the station's designers to take advantage of the most efficient, long-term track layout without having to worry about razing occupied buildings and rerouting underground utilities and other structures. Hudson Terminal will feature extra long, double-width platforms with multiple ADA-compliant entrance and exit points. Further, provisions will be made at the time of construction to one day accommodate a second, sub-level of platforms beneath the main structure and/or additional trackage to points north and east. The outside terminal tracks, which are fed by the tunnel's lower-level express tracks, would loop around the northern end of the terminal to allow for Amtrak and future high-speed rail trains to continue to additional destinations without reversing the direction of the train. In addition, the loop would also include its own dedicated platforms for use by Hudson-Bergen Light Rail.

In estimating construction costs, there are two notable recent examples from which to draw upon for cost comparison. The Tianjin West Railway Station in Tianjin, China contains identical design elements (it is used for all of the station renderings throughout this proposal) including trackage, platform, concourse, and retail design elements. The Tianjin West Railway Station was completed in 2011 at a cost of \$400 million. Secondly, the West Kowloon Terminus in Hong Kong is a state-of-the-art transit hub under construction at the southern terminus of the Guangzhou-Shenzhen-Hong Kong Express Link. Estimated to be completed by 2015, the West Kowloon Terminus, which is designed to serve 100,000 daily passengers, will cost \$1.2 billion. Based on these comparisons, and applying a 50% multiplier, Hudson Terminal is estimated to cost \$2.7 billion. This consists of \$1.5 billion for horizontal construction, including land reclamation and track assembly, and \$1.2 billion for vertical construction.

Hudson Terminal Track Diagram



Hudson Terminal Cross-Section





Phase I Mass Transit Improvements

West Side Mass Transit

Improvements

Hudson Terminal's placement at the intersection of 14th Street and 11th Avenue is highly strategic in that it allows for key connections to existing mass transit infrastructure, which will also serve to catalyze growth on Manhattan's West Side. The mass transit improvements will proceed in three distinct phases, with the first phase coordinating its completion with the completion of the new Hoboken Tunnel and Hudson Terminal transit hub.

Phase I: Overview

By 2015, the 7-Line Subway Extension will be complete and a new station at 34th Street and 11th Avenue will open to the public. Tail tracks from the 7-Line extension will already extend to 25th street. In order to provide rapid transit access to commuters arriving at Hudson Terminal, two strategic connections will be made. First, the 7-Line will be extended another 11 blocks southward to 14th street. New stations at 23rd street and 14th street will be constructed

along the route. The overall impact of this extension would bring NJ commuters a direct connection from Hudson Terminal to the Hudson Yards, Times Square, Bryant Park, and Midtown East. In addition, to the delight of residents, commuters, and tourists alike, there will finally be a direct subway transfer between rail terminals serving NJ Transit (Hudson Terminal) and Metro North (Grand Central Terminal). Second, the L-Line will be extended westward by two avenues, joining the 7-Line at Hudson Terminal. This would, for the first time, provide residents of Union Square, the East Village, Stuyvesant Town, Williamsburg, Bushwick, and East Brooklyn a one-seat ride to a regional transit hub. The total population served (residents and commuters) would be approximately 1.2 million people.

Phase I: Current Conditions



Abandoned Pier 56 at 14th Street



100 Eleventh Avenue and the IAC Center at 19th Street



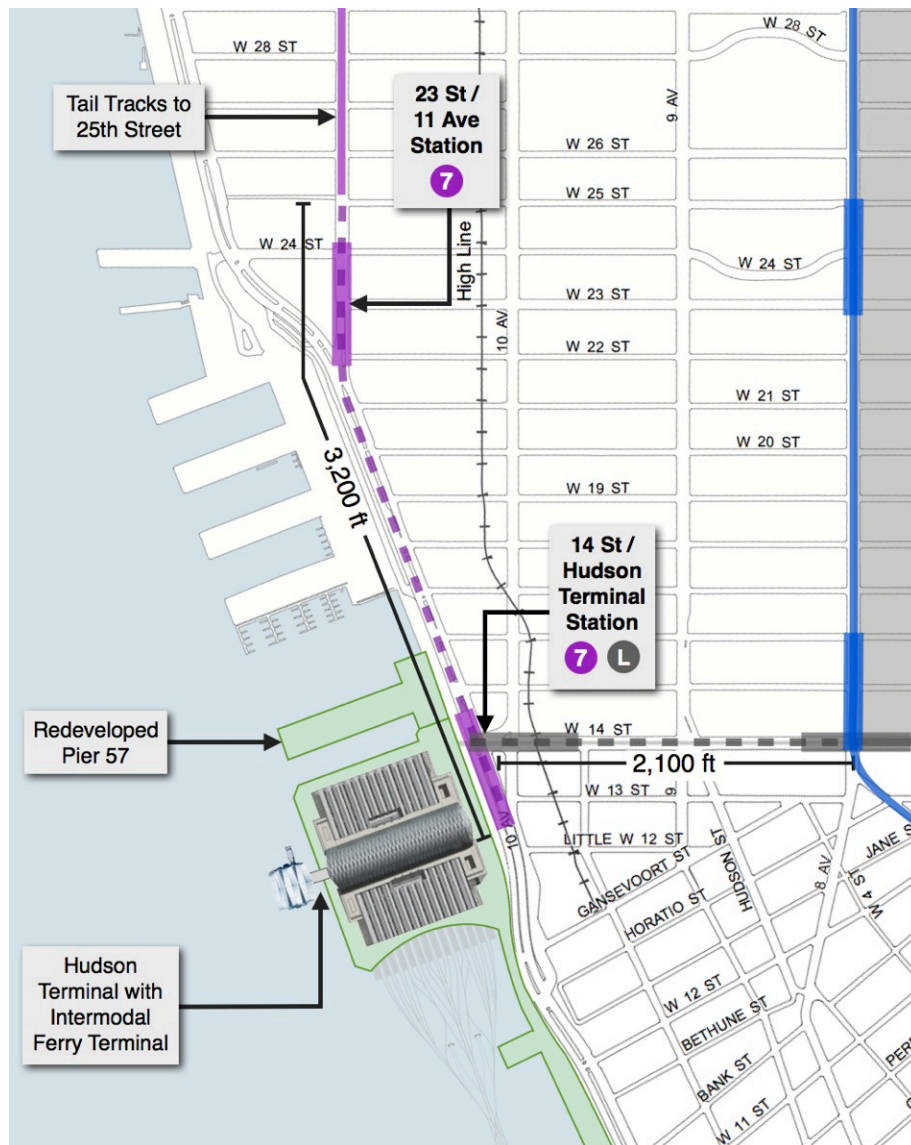
200 Eleventh Avenue at 23rd Street



Hudson River Park at 23rd Street



The Standard Hotel on The High Line at 13th Street



Phase I: Construction

By 2014, the 7-Line Extension will be complete and a new subway station will open at the intersection of 34th Street and 11th Avenue. However, construction of tail tracks will continue as far south as 25th street. This means that, in order to further extend the 7-Line to Hudson Terminal at 14th Street, only 3,200 feet of new tunnel will need to be constructed. In addition, two new stations will be built at 23rd Street and 14th Street. The L-Line's tracks terminate at 8th Avenue, thus requiring the construction of approximately 2,100 feet of new track and one new station at 11th Avenue.

An additional extension of the 7-Line below 25th Street would present several engineering challenges due to the relative proximity of the tracks to the Hudson River. However, the 7-Line

Extension already enjoys two

key advantages that will render these potential challenges less problematic. First, the 7-Line Extension along 11th Avenue has already employed the use of a deep-bore method of tunneling through solid bedrock, a construction method that is essential for tunneling beneath bodies of water. This tunneling method was employed because 11th Avenue used to reside beneath a body of water—the Hudson River. Only after the turn of the 18th century was most of Manhattan's current coastline formed from landfill. Second, the 7-Line Extension has the advantage of being located deep beneath the street surface. Unlike most subway lines, which are situated an average of 20 to 60 feet below street level, the 7-Line Extension is 130 feet below street level. At this depth, the 7-Line's tail tracks are forged in solid bedrock well below the Hudson River bed and can accommodate grade decreases to deeper bedrock levels as the line travels farther south.

The current 7-Line Subway Extension to the Javits Center consists of 7,100 feet of dual tunnels and one deep cavern station at a total cost of \$2.1 billion, for a construction cost of approximately \$1.5 billion per mile of track laid. The original plans also called for the construction of a station at 10th Avenue for an additional cost of \$450 million. Applying identical construction techniques and pricing, the Phase I mass transit improvements are estimated to be completed at a total cost of approximately \$2 billion.

Phase II: Overview

Phase II will move forward with the goal of providing mass transit to Manhattan's West Side. Dedicated stations will be constructed at 42nd Street, 50th Street, and 59th Street. The north-south route along 11th Avenue would become its own dedicated service line—the 11th Avenue Line. The northern terminus of this line, designated the 8 Line, would also connect to a new Amtrak/Metro North station along the West Side Line at 59th Street. The total population served (residents and commuters) would be approximately 900,000 people.

Phase II is particularly complicated from an engineering standpoint due to the need to construct a double junction above the 34th Street / Javits Center station. Since an at-grade double junction is impracticable, a flying junction would need to be built. Flyovers, such as the one required to continue the subway line above 42nd Street, typically require a lot of space both lengthwise and crosswise, and as a result, cannot always be built. However, due to the deep construction of the line and large cavern design of the 34th Street / Javits Center station, construction of the junction is feasible, albeit expensive. At a total length of 4,800 feet, Phase II is estimated to be completed at a cost of \$2.1 billion, including \$1.2 billion in tunneling costs, and \$900 million in station costs.

Phase III: Overview

Phase III involves extending the 11th Avenue Line south to the World Trade Center. Interim stops at Houston Street and North Moore Street would also be included. For the first time in New York City's history, residents of the



Phase II Mass Transit Improvements

neighborhoods west of Hudson Street will have access to a mass transit line. In addition, Battery Park City residents will be able to access the subway system without having to cross West Street. The total population served (residents and commuters) would be approximately 650,000 people.

From a construction standpoint, Phase III's biggest obstacle is incorporating the World Trade Center station into the existing World Trade Center infrastructure. Connections may be made with the West Street underpass linking the World Trade Center and World Financial Center. At a total length of 10,500 feet, Phase III is estimated to be completed at a cost of \$3 billion, including \$2.2 billion in tunneling costs, and \$800 million in station costs.

The completion of Hudson Terminal and addition of an extended 11th Avenue Line will provide dramatic improvements to mass transit for New Jersey commuters, Amtrak riders, West Side residents, and all New Yorkers. For the first time, a commuter from northern New Jersey will be able to take a one-seat ride to Manhattan and transfer to a subway line that could take her to Times Square, the World Trade Center, or the new Hudson Yards Commercial District.

11th Avenue Line Facts

- Over 4.5 miles of new tunnels running from the World Trade Center to 59th Street with 8 new stations. These stations will comprise the first completely ADA-accessible subway line in New York City.
- Total cost for combined phases is \$7.1 billion over 16 years at an average per year cost of \$444 million.
- Three phases are estimated to be completed by 2028.
- Total population served is approximately 3 million people, including residents and commuters. The stations along the new 11th Avenue Line are expected to serve 1 million passengers daily by 2030.
- Will reduce travel times for those living on Manhattan's West Side by an average of 15 minutes.
- Will provide access for those living west of Hudson Street / 9th Avenue to the New York City subway system for the first time in the city's history.



Phase III Mass Transit Improvements



Financing, Impact, Alternatives

Budgeting and Politics

The total estimated costs for the Hudson Terminal Plan amount to \$7.8 billion over eight years, with the bulk of consultation and engineering analysis occurring in the first two years and the bulk of construction occurring in the middle three years. All aspects of the plan will be executed concurrently so that Hudson Terminal, Hoboken Station, and Phase I of the West Side mass transit improvements can all open by the end of the eighth year of construction. This budget does not account for potential increases in rental income resulting from this plan including increased ticket revenue, retail leases, and increased tax revenue. Further, this budget does not account for potential increases in operating budgets for the various elements of the plan including NJ Transit, Amtrak, and MTA Subway service. Lastly, for the purposes of budgeting, only Phase I of the West Side mass transit improvements have been taken into account.

Hudson Terminal Plan Proposed Budget (in millions)									
Construction Year	1	2	3	4	5	6	7	8	
Engineering Analysis / Consultation	\$200	\$200	\$50	\$50	\$50	\$10	\$10	\$10	\$580
Hoboken Station Redevelopment	\$0	\$25	\$50	\$100	\$100	\$100	\$75	\$0	\$450
Hoboken Tunnel	\$0	\$50	\$400	\$400	\$400	\$400	\$300	\$150	\$2100
Hudson Terminal	\$0	\$100	\$250	\$600	\$600	\$600	\$450	\$100	\$2700
Mass Transit Improvements	\$0	\$50	\$350	\$350	\$350	\$350	\$350	\$200	\$2000
Total	\$200	\$425	\$1100	\$1500	\$1500	\$1460	\$1185	\$460	\$7830

In determining the division of costs and control, several equitable factors must be considered for each element of the plan. As has been used in the past by large-scale transit projects, the Hudson Terminal Plan will be eligible for federal funding commitments under the Federal Transit Administration's New Starts Program. Under this program, funding is directed to public agencies on a largely competitive basis for the construction of new fixed-guideway transit systems and the expansion of existing fixed-guideway systems. Thus, New Starts would apply to all elements of the Hudson Terminal Plan. For projects of comparable size and scope, New Starts typically allocates ~35% funding for ~65% in state and local commitments. Thus, the expected federal commitment for the Hudson Terminal Plan under New Starts is approximately \$2.7 billion, which is comparable to the contribution made to the LIRR's East Side Access project. In addition to New Starts, the Hudson Terminal Plan may also be eligible for other federal funding programs such as the Federal Highway Administration's Congestion Mitigation and Air Quality Improvement Program and the Federal Transit Administration's Alternatives Analysis Program as well as TIFIA and RRIF loans.

In terms of state and local funding and control, it is important not to repeat the mistakes made in the financing and operation of Penn Station. Accordingly, the only metropolitan agency with both the oversight experience and sound financial footing to own and operate Hudson Terminal, including Hoboken Tunnel, is the Port Authority of New York and New Jersey (the Port Authority). The Port Authority, which runs a broad spectrum of New York City's regional transportation infrastructure, is an independent agency sanctioned by the state governments of New York and New Jersey. It holds over \$33 billion in metropolitan assets, including the region's three main airports, the George Washington Bridge, Lincoln Tunnel, Holland Tunnel, PATH Rail Transit System, the Port of New York and New Jersey, and the

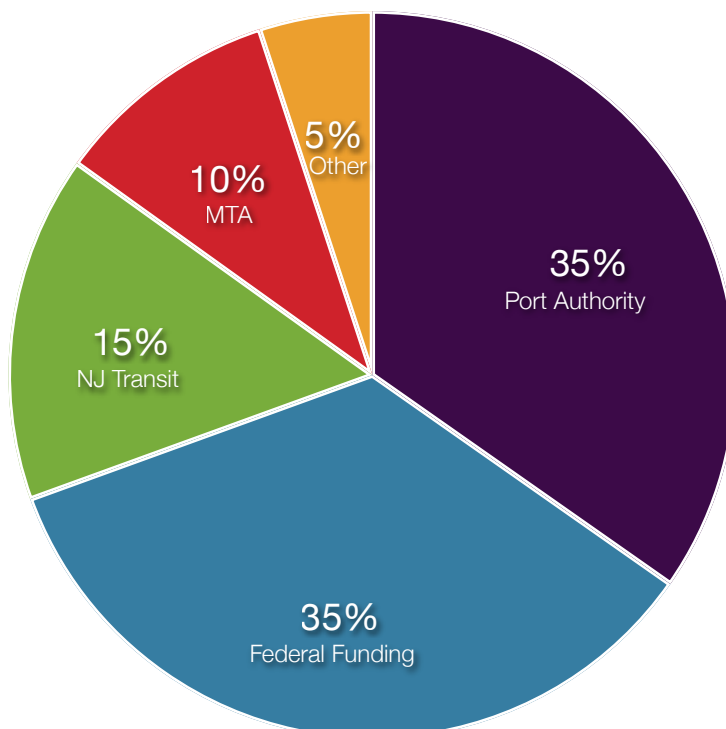
World Trade Center. Whereas Amtrak relies on Penn Station to offset its losses elsewhere within its international rail network, the Port Authority, by owning and operating Hudson Terminal, would have a vested interest in the terminal's long-term success. In addition, unlike Amtrak, the Port Authority does not receive tax subsidies, and as a result, is significantly more reliant on its own operating revenues for income. Penn Station's success depends on the whimsy of

The Port Authority's Fiscal Health (in millions)

	2011	2012	2013
Gross Operating Revenues	\$3,801	\$4,050	\$4,184
Gross Operating Expenses	\$2,565	\$2,589	\$2,596
Net Operating Income	\$1,236	\$1,461	\$1,588
Other Revenues	\$1,005	\$156	\$264
Other Expenses	\$1,540	\$421	\$826
Other Net Loss	-\$534	-\$577	-\$562
Total Increase in Net Assets	\$701	\$1,135	\$1,028

federal politics in a given year. On the other hand, Hudson Terminal's success will be dependent upon the success of the region's transportation infrastructure as a whole, with which the Port Authority too has a vested interest.

Hudson Terminal Proposed Funding by Source



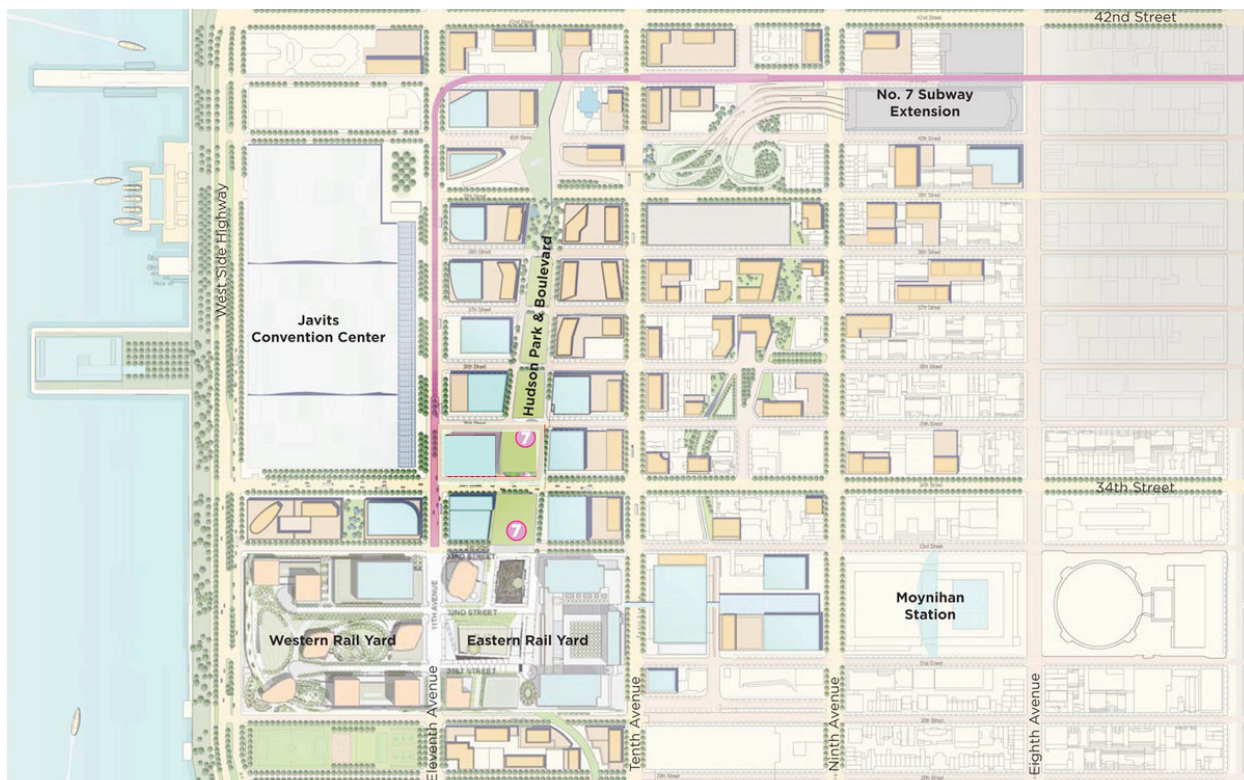
In terms of total funding allocations, the federal funding programs will account for approximately \$2.7 billion or 35% of total funding. Other funding sources are estimated to account for an additional \$392 million or 5% of total funding. The Port Authority will account for approximately \$2.7 billion or 35% of total funding. NJ Transit, which will retain ownership in the renovated Hoboken Station, will account for approximately \$1.2 billion or 15% of total funding. Lastly, the MTA, which will retain ownership of its mass transit improvements, will account for approximately \$783 million or 10% of total funding.

Capturing Value Through Transit-Oriented Development

Transit-Oriented Development (“TOD”) involves the strategic and mutually-beneficial construction or redevelopment of mixed-use properties in the immediate vicinity of a transportation infrastructure project. Successful TODs add value to a given public transportation project by not only encouraging new ridership, but also catalyzing economic development. To that end, where transit projects have difficulty securing funding through traditional routes, a comprehensive TOD plan may assist in raising capital by leveraging future development revenues in exchange for financing. Government agencies traditionally help to implement successful TODs through the imposition of district-specific zoning changes, issuance of bonds, and utilization of a number of strategic value capture mechanisms.

The Hudson Yards Redevelopment Project

In New York, one of the most prominent examples of the mutually beneficial relationship between transportation improvements and TOD is the Hudson Yards Redevelopment Project (“HYRP”). In the early 2000s, and in conjunction with a bid to host the 2012 Olympics, the City of New York and MTA proposed extending the 7-Line Subway to Manhattan’s West Side at 34th Street and 11th Avenue and redeveloping the adjacent, underdeveloped areas. However, despite the City’s advocacy for the project, the MTA (a state agency) had already prioritized funding for other transit projects including the LIRR’s East Side Access and Second Avenue Subway. Viewing the 7-Line Subway Extension as an opportunity to catalyze economic development along Manhattan’s West Side, the Bloomberg Administration sought to fund the transportation project independently of the MTA by leveraging future TOD revenues in exchange for financing. The first step towards achieving this goal involved the rezoning of 45-blocks of mostly manufacturing space in the vicinity of the 7-Line Subway Extension to allow for the future commercial and residential development. This zoning amendment allowed for the creation of 25.8 million square-feet of office space, 20,000 housing units, two million square-feet of hotel space, one million square-feet of retail space, and 20 acres of parks and open space, including the ten-block Hudson Park and Boulevard in between 10th and 11th Avenues.



Hudson Yards Redevelopment Project Master Plan



Hudson Yards Detail (Related Companies / Oxford Properties)

In order to facilitate the HYRP, the City of New York created the Hudson Yards Development Corporation (“HYDC”) to manage the planning, design, and development of the project area, not including the actual 7-Line Subway Extension, which would be managed by the MTA. The City also created the Hudson Yards Infrastructure Corporation (“HYIC”) to finance the capital improvements required to implement the HYRP. Since 2007, the HYIC has raised \$3 billion in proceeds from two bond offerings. In order to secure and repay these bonds, the HYIC and HYDC put forth several means of capturing the added value of the new real estate developments under the HYRP. The largest source of revenue is set to come from commercial payments in lieu of taxes (“PILOTs”). Under a PILOT arrangement, the New York City Industrial Development Agency (“NYIDA”) would purchase the land to be developed from a developer for a nominal amount, which would in turn relieve the developer from paying traditional property taxes. Thereafter, over the course of the next 30 years, the developer would pay a determined price per square foot to the NYIDA, who would then transfer those proceeds to the HYIC. At the end of the 30 years, the property would be sold back to the developer for a nominal price and the developer would resume paying normal property taxes. In order to incentivize new developments prior to the build-out of the site, the NYIDA was empowered by the City to discount the PILOT rates below normal property tax rates depending on location and completion date of a given development. For those developers that opt out of the PILOT program, the City of New York has agreed to repay the HYIC all property taxes received from properties constructed after 2005 in the form of Tax Equivalency Payments (“TEPs”).

Another source of revenue for the HYIC will come from the sale of various transferrable development rights (“TDRs”) tied to the development of the eastern half of the MTA’s West Side Yard (the “Eastern Rail Yard”). Developers are traditionally allowed to build, as-of-right, a building with a maximum total floor area comprised of the sum of the lot size multiplied by the zoned floor-area ratio (“FAR”) for the given lot. For instance, a developer looking to build an office tower on a 10,000 square-foot lot with a FAR of 6 can construct, as-of-right, a 60,000 square foot building. The City’s zoning changes increased the as-of-right and maximum FARs for the Eastern Rail Yard to allow for the construction of 10.8 million square

feet of new mixed-use space. However, since the HYRP requires the incorporation of parks, large public plazas, and other non-commercial elements throughout the project site that restrict maximum development, the MTA was only able to lease 5.1 million square-feet of development rights over the Eastern Rail Yard, which is set to raise over \$1 billion in rental payments over the 99-year term of the lease. In 2007, the HYIC purchased from the MTA a 50% interest in over 4.5 million square-feet of TDRs from the unusable space over the Eastern Rail Yard for \$200 million. Hudson Yards developers wishing to increase a given property's FAR may purchase these TDRs, of which the proceeds will go to the HYIC until it recoups its initial \$200 million investment plus interest. The proceeds from sale of these TDRs after this point will then go to the MTA. Developers may also increase their FAR through the purchase of District Improvement Bonuses ("DIBs") from the HYIC, which function in a similar manner to the Eastern Rail Yard's TDRs. While they are priced somewhat differently, today, TDRs and DIBs may be purchased for approximately \$125 per additional square-foot.

HYIC Revenue and Expenses

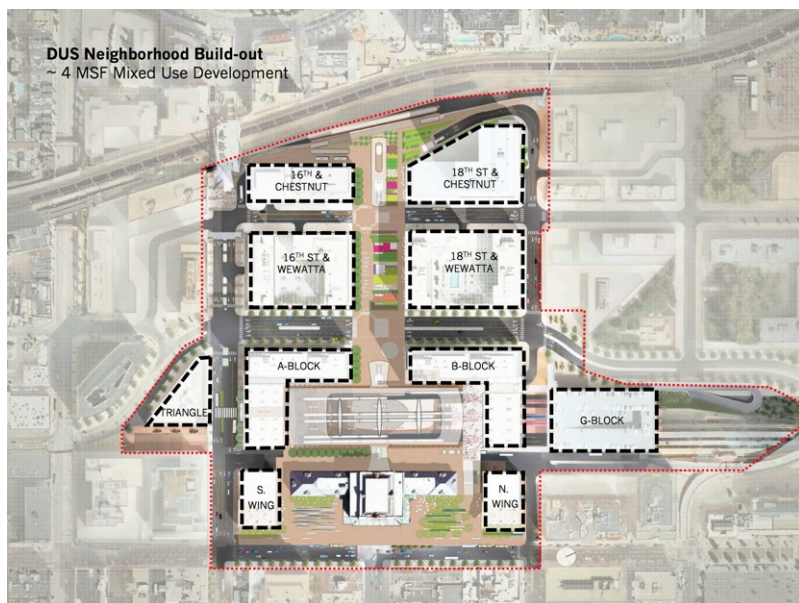
2006 to 2013, millions of dollars

	2006	2007	2008	2009	2010	2011	2012	2013	Total
Revenues									
PILOT Revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TEP Revenue	\$0	\$5	\$2	\$8	\$13	\$26	\$28	\$33	\$114
Eastern Rail Yards TDRs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DIB Revenue	\$11	\$58	\$7	\$5	\$0	\$5	\$3	\$3	\$91
Interest on Bond Proceeds	\$0	\$43	\$127	\$58	\$20	\$3	\$1	\$2	\$254
Other	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14	\$14
Total Revenue	\$11	\$106	\$136	\$70	\$33	\$33	\$32	\$52	\$473
Expenses									
7-Line Subway Extension	\$0	\$38	\$249	\$392	\$310	\$276	\$316	\$325	\$1,906
Land Acquisition	\$0	\$71	\$265	-\$44	\$10	\$69	\$19	\$19	\$409
Transfers to HYDC	\$2	\$6	\$3	\$5	\$4	\$3	\$3	\$2	\$28
Bond Interest / Other	\$0	\$30	\$107	\$91	\$89	\$89	\$122	\$141	\$669
Total Expenses	\$2	\$145	\$623	\$444	\$414	\$437	\$460	\$487	\$3,012

The HYIC has yet to capitalize on most of its value capture mechanisms, including PILOT and TDR revenue, because very few eligible projects have begun construction, and those that have begun construction will not be completed (and thus generate revenue) for several years. The HYIC has, however, raised over \$200 million in TEP and DIB revenue since 2006 on developments that were completed during the earlier stages of the HYRP. Through 2013, the HYIC has spent nearly \$2 billion on the 7-Line Subway Extension, which has been funded chiefly by its two bond issuances that raised \$3 billion. The HYIC has also spent over \$400 million in land acquisition and public amenity construction in order to implement various elements of the HYRP, including Hudson Park and Boulevard as well as other public spaces. As the construction of the subway wraps up in 2015 and the first large-scale developments open in the upcoming years, the HYIC will begin generating increasing revenues, which will allow them to repurchase their bonds and fully implement the HYRP. Because of the strategic partnership between transportation infrastructure improvements and real estate development, the HYRP has not only helped to facilitate the construction of an expensive transit project, but will also increase ridership, create a new livable and workable district in a previously depressed area of Manhattan, and catalyze economic development.

Other Methods of Capturing Value

There are a number of other ways in which government agencies charged with developing TODs are able to capture the added value created by new transportation infrastructure projects. One of the most common strategies is through the assessment of district-specific taxes on properties directly benefiting from a transportation infrastructure project, which operate similarly to PILOT agreements. One recent example of the utilization of special district assessment taxes was the construction of the Washington Metro's NoMa – Gallaudet U Station in 2004. As part of the project's financing, private landowners set to benefit from the station's construction agreed to pay a special assessment tax over 30 years to raise \$25 million of the \$100 million total project cost. This special assessment tax will be charged on top of regular property taxes for nonresidential parcels located within 2,500 feet of the future station's entrances. The Washington Metropolitan Area Transit Authority financed the project, in part, by issuing bonds that will be repaid using the funds collected through the special assessment tax over the subsequent decades.

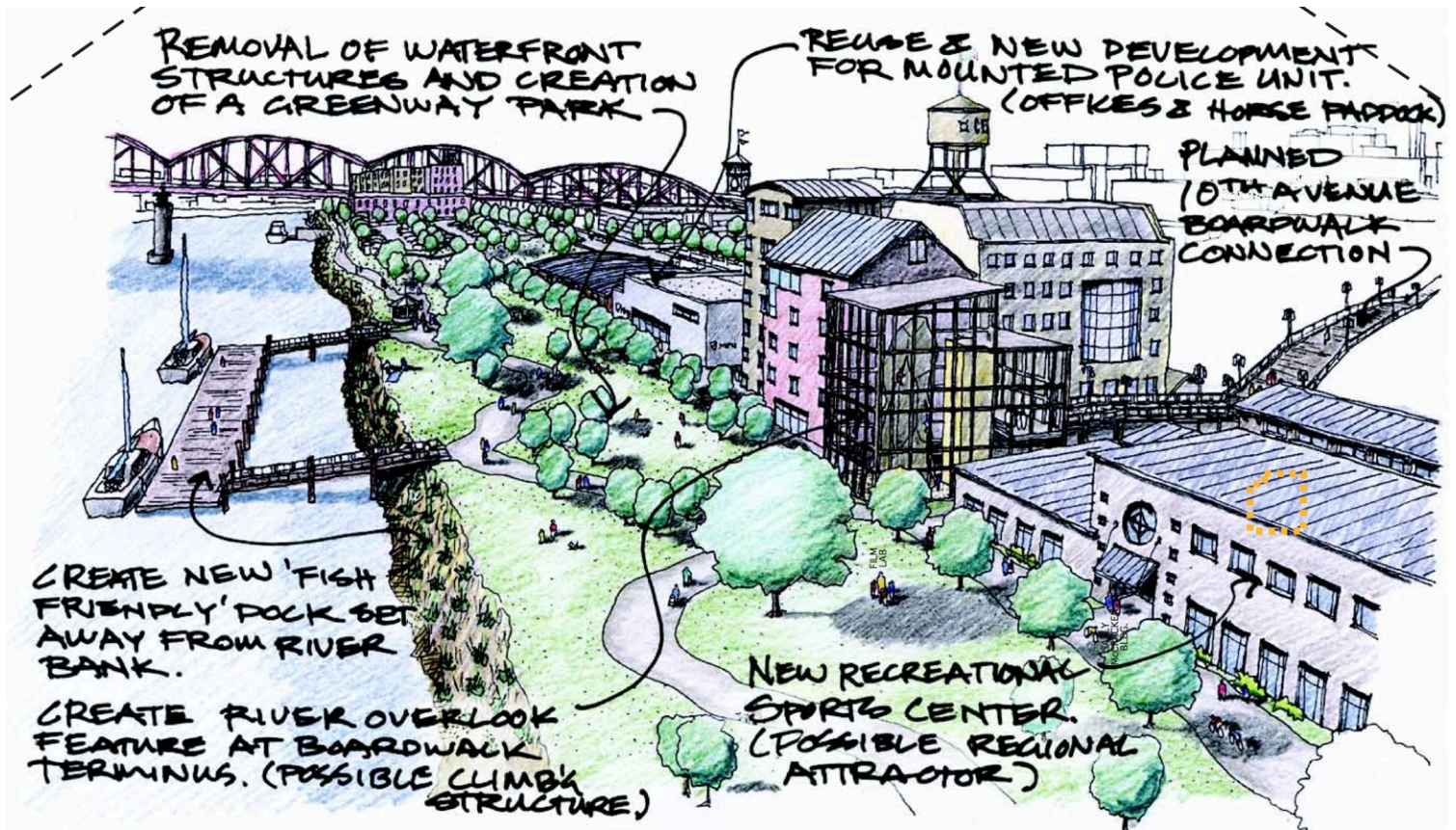


Denver Union Station Redevelopment District Master Plan



Denver Union Station Redevelopment Rendering

Another method of capturing value from TODs is through Tax Increment Financing ("TIF"), which involves promising future tax revenues to secure present financing arrangements. Since infrastructure improvements increase property values, which results in higher tax revenues, government agencies are able to leverage those future revenues through TIF proposals in order to finance a given infrastructure project. For example, as part of its \$488 million redevelopment of Denver Union Station, the Denver Union Station Project Authority ("DUSPA") obtained a \$155 million, 3.91%, 30-year loan from the Federal Railroad Administration's Railroad Rehabilitation and Improvement Financing ("RRIF") program, which operates similarly to the US DOT's TIFIA program. In order to secure and pay for the RRIF loan, the Denver Downtown Development Authority, which oversees TOD within the 40-acre project site, agreed to appropriate all tax increment revenue over the next 30 years to DUSPA. Because TIF relies on predicting future tax revenue, the City and County of Denver agreed to appropriate up to \$8 million annually during the term of the RRIF loan to cover any potential shortfalls in tax increment revenues.



Portland's Pearl District Development Plan Rendering (2001)

Another popular method of capturing added value is through public-private joint ventures. Since transit agencies often lack the expertise and resources to develop certain aspects of TODs on their own, they may enter into joint development agreements with private partners to construct TODs on publicly-owned land. For the HYRP, this involved the leasing of the publicly-owned Eastern Rail Yard to a joint venture between the Related Companies and Oxford Properties. In another example, funding for a the 2011 construction of the West Dublin/Pleasanton infill commuter station outside of San Francisco was achieved through a public-private partnership between Bay Area Rapid Transit ("BART") and private developers. Under the arrangement, the private developers prepaid \$15 million of the \$100 million project cost for a ground-lease to develop a transit village on three acres of government-owned land adjacent to the new station. In addition to the one-time payment, the developers also agreed to pay BART a fee for every sale of residential units within the development, which would allow BART to continue to capture value from its new station.

Public-private partnerships may also be used in instances where the sale or lease of public land is not available. Private investment can be leveraged where public entities engage in risk-mitigation of private developments through environmental remediation, entitlement and construction risk mitigation, financing assistance, and marketing of a given TOD. In Dallas, for instance, the Dallas Area Rapid Transit Authority ("DART") engages developers by providing market analyses for transit projects, which in turn reduces predevelopment costs. In another example from the late 1990s, the City of Portland negotiated with the owner of a 40-acre parcel of land adjacent to the proposed alignment of a new streetcar extension to increase the minimum construction density of residential and commercial development within the project site in exchange for bringing the streetcar past the owner's property and making other area improvements. Almost 20-years later, the neighborhood of the TOD is today one of the most popular areas in the city and, at build-out, will be home to 10,000 residents and over 20,000 jobs. The success of this public-private partnership has led to the expansion of the streetcar system in Portland and creation of new, more extensive joint TOD ventures.

TOD and the Hudson Terminal Plan

The Hudson Terminal Plan provides significant opportunities for strategic TODs to increase ridership, drive economic development, and catalyze financing for a given segment of the overall project. From New Jersey, the four-track Hoboken Tunnel would breach the New York pierhead line in the area of Pier 45 at West 10th Street, whereabout it would curve northwards along the waterfront and branch out to 26 station tracks. In total, the feeder and station tracks from the pierhead line up to the station would stretch for approximately 13 blocks along the Hudson River. In order to secure this track infrastructure, Hudson Terminal would require the installation of a slurry wall-reinforced “bathtub” similar to the one used at the World Trade Center or the utilization of landfill similar to the land underlying Battery Park City. Either way, the construction of Hudson Terminal will result in the creation of approximately 80 acres of new land, upon which significant development could occur. Acting as a southern extension of the large-scale redevelopment already occurring on Manhattan’s West Side, this new “Hudson City” would help to catalyze the implementation of Hudson Terminal Plan through economic development and value capture mechanisms.

Like the HYRP, Hudson City would require zoning changes to allow for the construction of a mixed-use neighborhood over the Hudson Terminal infrastructure. However, unlike the HYRP, the entirety of the underlying land upon which Hudson City would be built would be government-owned. Thus, bonds used to finance Hudson Terminal’s construction could be secured and repaid by fees received through the sale of lots within Hudson City as well as the sale of additional TDRs and DIBs. In order to further capture value from Hudson City developments, the agency overseeing the implementation of the Hudson Terminal Plan could also impose special assessment taxes on new developments within the site and engage in public-private partnerships.

In total, Hudson City would encompass 8 million square-feet of new commercial space, 1.2 million square feet of new retail space, 10,000 new residences, and 25 acres of new park and public plaza space. By constructing a major transit hub on the waterfront, Hudson Terminal will be able to capture a far greater percentage of the added value from TOD than would be possible from improving transportation infrastructure within an already built-out site within Manhattan.

Hudson City Master Plan



Economic Impact

The Hudson Terminal Plan will enable trains on the Main, Bergen County, Pascack Valley, Port Jervis, and Meadowlands Lines, which now terminate in Hoboken, to terminate in Manhattan. With the implementation of an improved Waterfront Connection, the Raritan Valley Line, the North Jersey Coast Line south of Bay Head, and the Montclair-Boonton Line west of Montclair State University would also have direct service to Manhattan. AM and PM peak hour NJ Transit service into Manhattan would increase from the current maximum capacity of 25 trains per hour to 73 trains per hour. Further, upon opening Hudson Terminal and Hoboken Tunnel, NJ Transit service into Manhattan would immediately double without having to increase the number of total daily trains due to the large number of existing trains that already terminate in Hoboken. Total trips into Penn Station would decrease slightly with this new service into Manhattan and as some Northeast Corridor trains are rerouted into Hudson Terminal.



Hudson Terminal Main Concourse

With the implementation of the Hudson Terminal Plan, the number of trans-Hudson bus trips would decrease by approximately 10%. Projected daily one-way linked trips on PATH service to midtown Manhattan would decrease by approximately 30% from 130,000 to 90,000. Future daily one-way linked ferry trips to midtown Manhattan would decrease by 30%. Further, daily demand for trans-Hudson auto (vehicle) trips would decrease by approximately 5% percent, and as a result, there would be fewer auto trips along local routes to commuter rail in the project area.



Hudson Terminal Track Level

In terms of jobs, the construction of Hudson Terminal and its related elements will result in the creation of approximately 6,000 construction-related jobs each year resulting in an increase in gross regional product by \$675 million per year and real personal income by over \$400 million per year. Direct, permanent economic benefits accruing to the metropolitan region as a result of the annual operation and maintenance of Hudson Terminal and its related elements include the direct employment of over 750 jobs in the transportation and transit services industries, almost \$16 million in local, state and federal taxes, \$46 million in personal income, and over \$120 million in business activity.

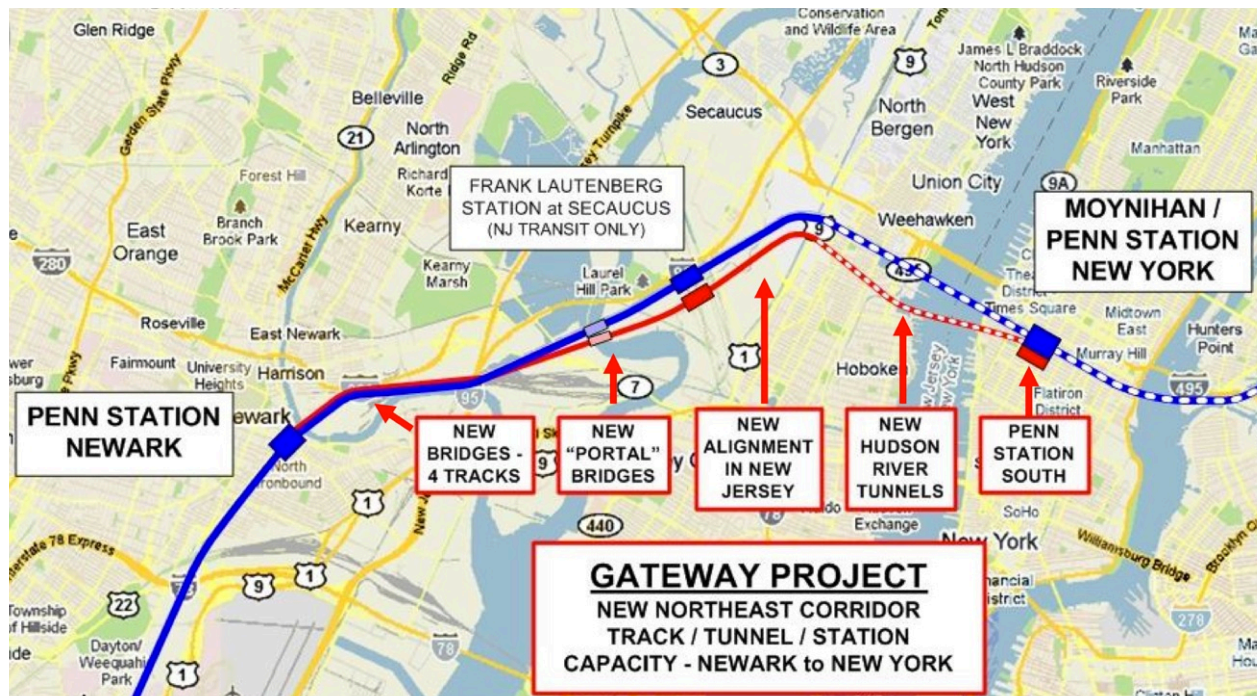
The implementation of the Hudson Terminal Plan will also have important long-term, indirect benefits for the economies of both New York and New Jersey. This is partly attributable to efficiencies resulting from increased NJ Transit operations and maintenance, but chiefly due to increased regional competitiveness within Manhattan's West Side development zones. The region as a whole would gain approximately 100,000 jobs within 10 years of Hudson Terminal's opening. These jobs will result from increased regional competitiveness as businesses relocate or expand within the region due to such factors as better quality of life, commuter access, transportation cost-savings, and lower regional housing cost. Gross regional product is projected to increase by \$12 billion as an indirect result of the implementation of the Hudson Terminal Plan, with total personal income benefits for the region increasing by nearly \$5 billion.

Alternative Proposals

Part of the reason why the Hudson Terminal Plan is favorable to the current alternative proposals is that it is focused on maximizing results for the New York metropolitan region as a whole, as opposed to picking favorites by agency. For instance, Amtrak's Gateway Project puts the majority of its resources towards furthering the federal goal of upgrading the Northeast Corridor for future high-speed rail. Or the MTA's 7-Line Extension to Secaucus proposal heavily favors New York City's mass transit infrastructure, but does nothing to improve cross-Hudson commuter rail capacity. As discussed in this section, by allocating resources inefficiently, not only are these proposals' final designs ineffective at addressing the region's transportation problems, but the visions proposed are shortsighted and costly.

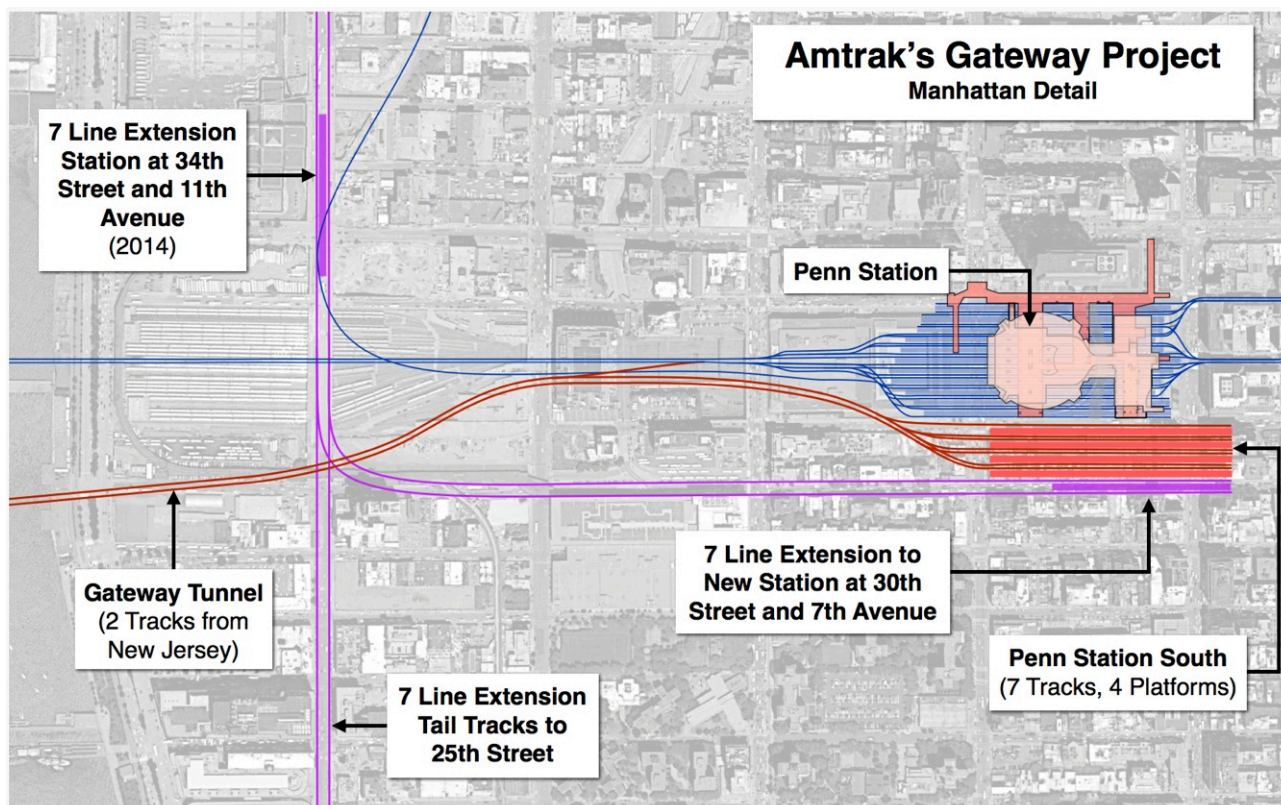
Amtrak's Gateway Project

Notwithstanding the Hudson Terminal Plan, Amtrak's Gateway Project is currently the only trans-Hudson transportation proposal on the table today. The Gateway Project consists of over 10 miles of new trackage from Newark to Manhattan. Included within this trackage are two new high-level, two-track portal bridges over the Hackensack River, which would connect to the already-built, four-track Secaucus Junction. Upon leaving Secaucus Junction, two tracks along a new alignment would travel east towards two new single-track tunnels passing under Bergen Hill towards Penn Station. Upon arriving into Manhattan, the two new tunnels would merge with trackage heading into Penn Station before ultimately terminating at a four-platform, seven-track annex station called Penn Station South. The Gateway Project also calls for an extension of the 7-Line from 34th Street and 11th Avenue to a new station at 30th Street and 7th Avenue, which would connect to the new Penn Station South annex. There have not been any feasibility studies completed at this time, but preliminary estimates put the total cost of the project at \$14.5 billion with a completion year of 2025.



Gateway Project Route from Amtrak's Presentation Materials

While the Gateway Project may, on its face, appear to address New York's transportation woes, in actuality, it suffers from numerous deficiencies. The most obvious of these deficiencies is the **enormous expense compared with the minimal benefit** provided to residents of the New York metropolitan region. The Gateway Project requires over 10 miles of new trackage to bring a total of just two new tracks into Manhattan across the Hudson River. The Hudson Terminal Plan, by contrast, takes advantage of existing rail infrastructure and accomplishes the same feat with just 4,100 feet of



new trackage—the distance from Hoboken to the western banks of Manhattan. In addition, it is unclear whether the \$14.5 billion estimate includes the 3,700 feet of new subway tunnel and new subway station at Penn Station South. Using price comparison methods, this extension alone would cost an additional \$1.2 billion. Since it would be significantly faster to reach destinations such as Times Square, Bryant Park, and Grand Central Terminal by using current subway lines near Penn Station, this \$1.2 billion extension would essentially act as a five-block link for only those commuters traveling from Penn Station to the Hudson Yards. Depending on the frequency of service, it may ultimately prove faster and more convenient to walk from Penn Station's northwest exit to the Hudson Yards. Given the large costs and small population served, the proposed 7-Line Extension to Penn Station South represents a reckless exercise in city planning by Amtrak. Finally, despite 10 miles of proposed new trackage, the Gateway Project lacks a vital rail link to Manhattan for passengers traveling along the Main Line, Bergen County Line, and Pascack Valley Line. This connection would, for the first time, provide passengers along these lines a one-seat ride into Manhattan at relatively minimal costs.

Amtrak's Gateway Project also **fails to fix the fundamental flaws with Penn Station's design**. Penn Station South neither contains a unified, central concourse nor open air spaces—two vital components of a successful transit hub. Instead, the Gateway Project does the opposite. It creates an additional disjointed space deep below the street level. In essence, Penn Station South annexes a basement to the basement that is Penn Station. Even if Penn Station South incorporated these necessary design elements, the Gateway Project still requires the demolition of scores of private buildings and residences within two midtown blocks on the site of the station. Among the 330 small businesses and 220 residents requiring relocation, Amtrak plans to raze the Blarney Stone, an Irish pub on 8th Avenue that has been serving locals and sports fans from Madison Square Garden for more than 50 years, and the Roman Catholic Church of St. John the Baptist, founded in 1840. As seen by the ongoing litigation involved with the construction of the Atlantic Yards development in Brooklyn, eminent domain battles take significant time and financial resources to fight, and threaten projects from getting off the ground at all.



Gateway Project Map from Amtrak's Presentation Materials

The Gateway Project also **fails to reform the bureaucratic and political hierarchy** in Penn Station's oversight and financing. As Amtrak's operating losses continue to run over \$1.2 billion annually, instead of reforming its holdings and reorganizing its bureaucracy, Amtrak plans on expanding its operations in the New York metropolitan region. As Amtrak expands its high-speed rail network and annual passenger volume continues to rise, it may be forced to use more and more trackage within Penn Station, a move it would be entitled to do as its owner. And despite billing Penn Station South and the Gateway Project as a transformative plan for New York City transit, it is unclear why Amtrak would not look to Penn Station South as another tentpole

for its losses in the same way it has done with Penn Station. New York City residents and commuters alike have seen for decades that Amtrak is not the landlord it wants running its primary transit hub in the future.

Lastly, and perhaps most disappointingly, despite its large cost, the Gateway project **does little to drastically reduce Penn Station's capacity constraints**. As stated earlier, over the past 35 years, the number of daily trains in and out of Penn Station has increased by approximately 90%. At the same time, total population in the New York metropolitan region has increased by only 13%, from 16.2 million people in 1970 to 18.4 million people in 2010. It is clear that rail use by the metropolitan population is increasing at a much greater rate than general population growth. As gas prices continue to rise and the public chooses commuter rail in greater and greater numbers, it would not be unreasonable to see rail usage double again in the next 35 years. Despite the expected growth of this mode of transportation, Amtrak has proposed increasing Penn Station hourly train capacity by a mere 48%, from 62 total trains per hour to 92 total trains per hour. Perhaps this increase would serve the at-capacity demand for rail travel already plaguing the system. But if demand for rail travel continues to grow at the current pace, the Gateway Project, which is scheduled to be finished by 2025, will be inadequate upon its completion and Penn Station will remain a choke point for the entire system.

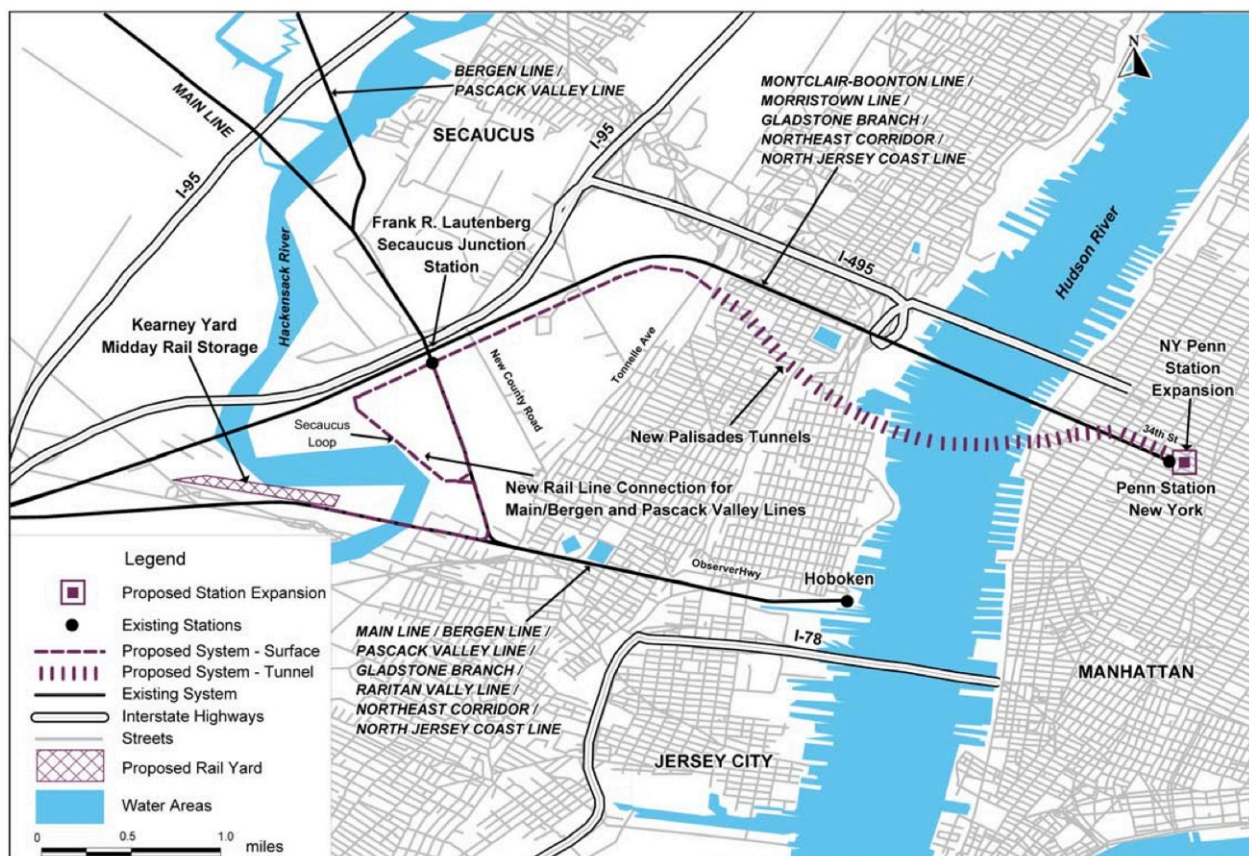
However, even if NJ Transit was able to fulfill the increased hourly train capacity maximums, it would have to greatly increase its service, requiring the purchase of new rolling stock, building of new train yards, hiring of new conductors and maintenance workers, and renting additional trackage from Amtrak's Penn Station South. Given that NJ Transit has operated at an average annual loss of over \$1.4 billion for the past three years, it is unclear how the New Jersey transportation budget would be able to absorb the broad expansion of rail service needed to utilize the improvements from the Gateway Project. By contrast, the Hudson Terminal Plan takes advantage of the nearly 300 daily trains that already travel to and from Hoboken, but that are currently underused due to their termination in New Jersey.

Even though cross-Hudson capacity would increase under the Gateway Project, albeit minimally, Penn Station would still only be left with a total of 28 tracks and 15 platforms to service 1,250 daily trains. By comparison, Grand Central Terminal services 572 daily trains with 44 tracks and 26 platforms. The current problems associated with delay in Penn Station are largely caused by the lack of train capacity within the station. Had Amtrak truly wished to provide a permanent solution to Penn Station's constraints, it would have included more than just 7 new tracks over 4 platforms.

No large-scale transit proposal will ever be perfect and every plan will contain tradeoffs to attain desired goals. However, the Gateway Project does not even attempt to tackle the complex transit problems that have afflicted New York and New Jersey residents for decades. The Gateway Project is neither bold nor imaginative, and does more to maintain the status quo than it does to prepare New York City for the next great wave of transportation infrastructure. By contrast, for half the total cost of the Gateway Project, the Hudson Terminal Plan will provide double the cross-Hudson rail capacity, a premiere new transit hub on the banks of the Hudson River, and sensible mass transit improvements to promote the growth of Manhattan's West Side and the metropolitan region as a whole.

Access to the Region's Core

Access to the Region's Core (ARC), which was officially abandoned in 2010, consisted of similar transportation elements as the Gateway Project, but with additional features such as a new Manhattan rail link for Main Line, Bergen County Line, and Pascack Valley Line trains, and a new Kearney Rail Yard for midday rail storage. The ARC improvements included 9.3 miles of new trackage (3.7 miles of new tunnel) and a new six-track, deep cavern station below 34th Street in between 8th and 6th Avenues. The estimated total cost of the project was \$8.7 billion with an estimated completion year of 2018. In terms of division of funding, the federal New Starts Program would have provided \$3.0 billion, or the



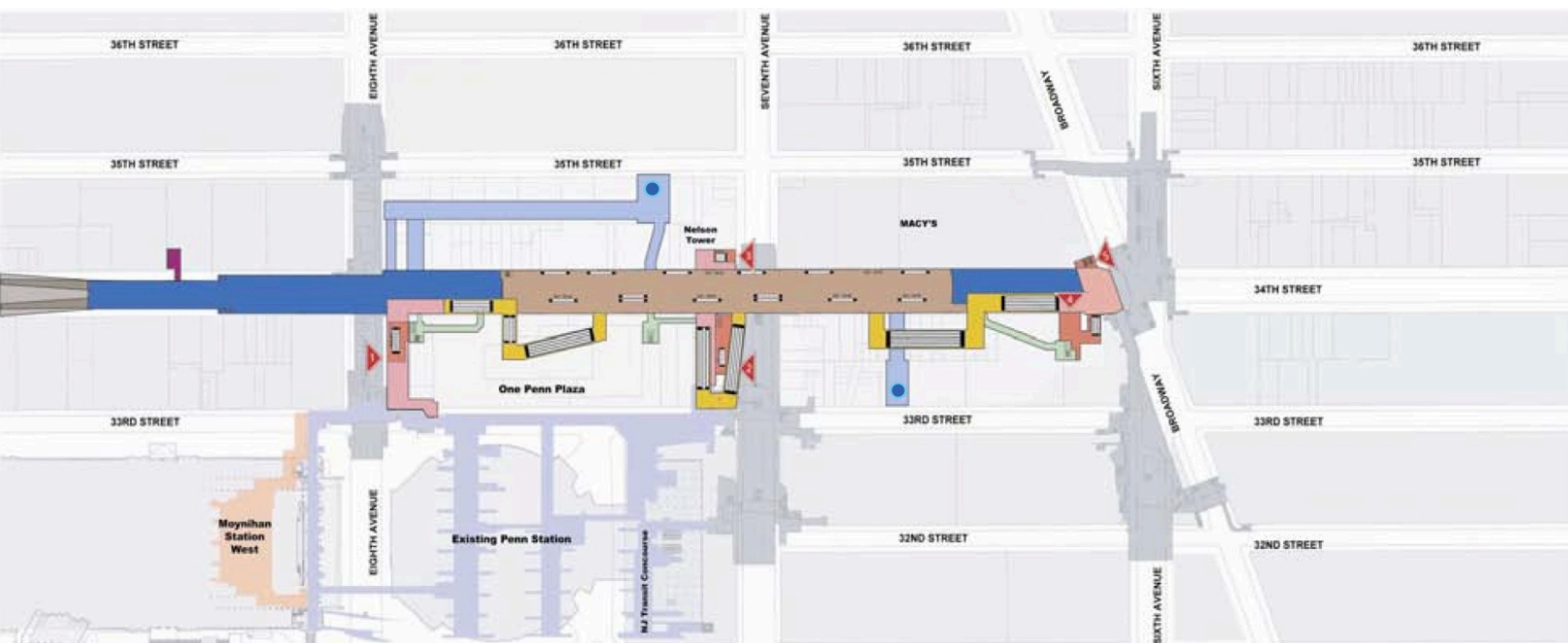
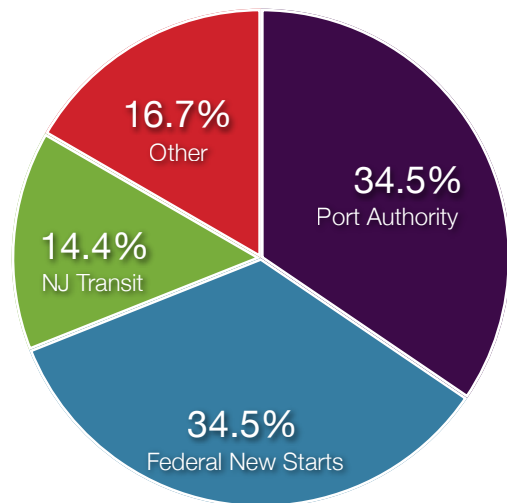
ARC Map from NJ Transit / Port Authority Presentation Materials

equivalent of 34.5% of total funding. The Port Authority would have also contributed \$3.0 billion. The State of New Jersey would have provided \$1.3 billion, or the equivalent of 14.4% of total funding. Lastly, other federal funding, including the Congestion Mitigation and Air Quality Improvement Program and the National Highway System, would have provided approximately \$1.4 billion, or the equivalent of 16.7% of total funding.

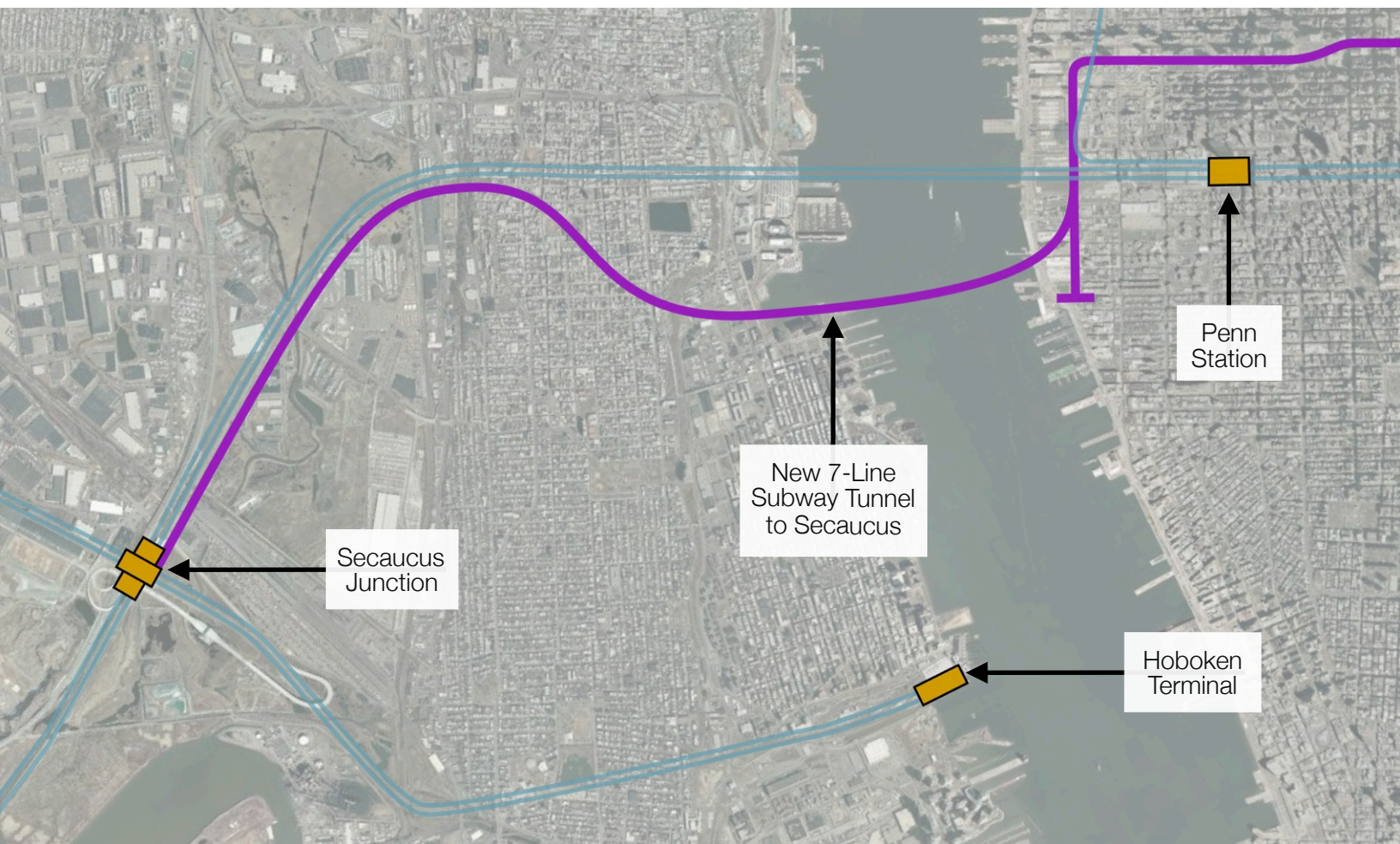
Similar to the Gateway Project, ARC suffered from numerous deficiencies, the most notable being the lack of significant improvements in both cross-Hudson and Manhattan train capacity. However, whereas the Gateway Project incorporated its new tunnels into existing Penn Station trackage, the ARC tunnels would have been completely independent from existing trackage, i.e., there would be no way to transfer between the ARC tunnels and Penn Station or the North River Tunnels and New Penn Station Expansion. Further, the New Penn Station Expansion below 34th Street suffered from the same design deficiencies as the current Penn Station. It would have had no open air space and no central concourse linking all of the station's tracks. In fact, the proposed station expansion would have descended over 150 feet below street level, making it one of the deepest transit stations within New York City and one of the most difficult to access from street-level. However, due to the thin design of the station cavern, it would not require the demolition of private property as is required under the Gateway Project.

Overall, ARC would have provided key benefits to the region such as connecting all of NJ Transit's lines to a Manhattan rail link, doubling cross-Hudson hourly train capacity, and connecting Penn Station to the BMT Broadway and IND 6th Avenue subway lines. All of this would have been accomplished at nearly half the cost of the Gateway Project's \$14.5 billion price tag. However, much like the Gateway Project, the ARC project did not go far enough to create a long-term solution to the challenges associated with the region's growing demand for rail travel.

ARC Proposed Funding by Source



ARC Manhattan Detail from NJ Transit / Port Authority Presentation Materials



7-Line Extension to Secaucus

An alternative transit proposal put forth by the City of New York is the extension of the 7-Line from Manhattan's West Side to Secaucus, NJ. However, in April of 2012, former MTA Chairman Joseph J. Lhota announced that the plan was too costly to carry out. Preliminary estimates have put the 8.5 mile extension in the \$10 billion price range with a completion year around 2020.

One of the reasons why the 7-Line Extension to Secaucus has been largely ignored by government officials and the public alike is that it provides relatively little public benefit for its large costs. It would mainly aid NJ Transit commuters wishing to travel to Manhattan's East Side by allowing them to transfer at Secaucus Junction. However, it is unclear whether such a transfer would even save commuters time since Penn Station already has access to two subway lines within one station of the 7-Line at Times Square. Further, the IND 6th Avenue Line's 34th Street / Herald Square Station, which is one stop from Bryant Park, is only one block from Penn Station's eastern exit points. The 7-Line Extension to Secaucus would also do nothing to ease Penn Station's capacity constraints, since the same number of daily trains would still travel to and from Penn Station. The only improvement would be a theoretical reduction in the number of passengers per train arriving into Penn Station.

The 7-Line Extension to Secaucus also does nothing to spur real estate development in either New York or New Jersey. Secaucus Junction, as it stands now, is in an isolated, industrial marshland off of the New Jersey Turnpike. There are no residential or commercial developments in the immediate vicinity of the station and there are no plans to create such developments. It is not surprising that this plan has been all but abandoned, as it would have been a white elephant in New York City's mass transit system.

Moynihan Station

Plans for a new above-ground transit hub to service the platforms and tracks within Penn Station were first proposed by Amtrak in 1992. Phase I of Moynihan Station, which broke ground in October 2010, involves the widening and expansion of LIRR's West End Concourse and installation of new street-level entrances within the Farley Post Office on the west side of 8th Avenue. Phase I will cost \$267 million and will be completed by 2016.

The much more ambitious part of the plan lies in Phase II, which has yet to secure funding or designate a start date. Phase II consists of the transformation of the Farley Post Office into a new, above-ground train station servicing Amtrak, NJ Transit, and LIRR. As part of this transformation, the courtyard in the middle of the eastern structure would become a large train hall with glass ceilings and direct access to many of the platforms below. In between the eastern and western structures, a high-ceilinged entry hall would be constructed to guide entering pedestrians to their respective destinations. Finally, new retail, restaurant, hotel, and commercial spaces will be constructed.

Unlike the Gateway Project, the ARC project, and the 7-Line Extension to Secaucus, Moynihan Station does not attempt to address the cross-Hudson capacity constraints that currently plague Penn Station. Instead, Moynihan Station attempts to relieve congestion within the station by unifying concourses, opening up walkways, and introducing new entrances and exit points. The floor plan of the new station draws from the successful floor plan of the original Penn Station. Moynihan Station also restores greatness to New York's transportation infrastructure by locating Penn Station within the grand, Beaux-Arts Farley Post Office. However, at a total estimated cost of \$1.5 billion, it is unclear what benefits will be conveyed by Moynihan Station that would not



Moynihan Station, Phase I, Exterior

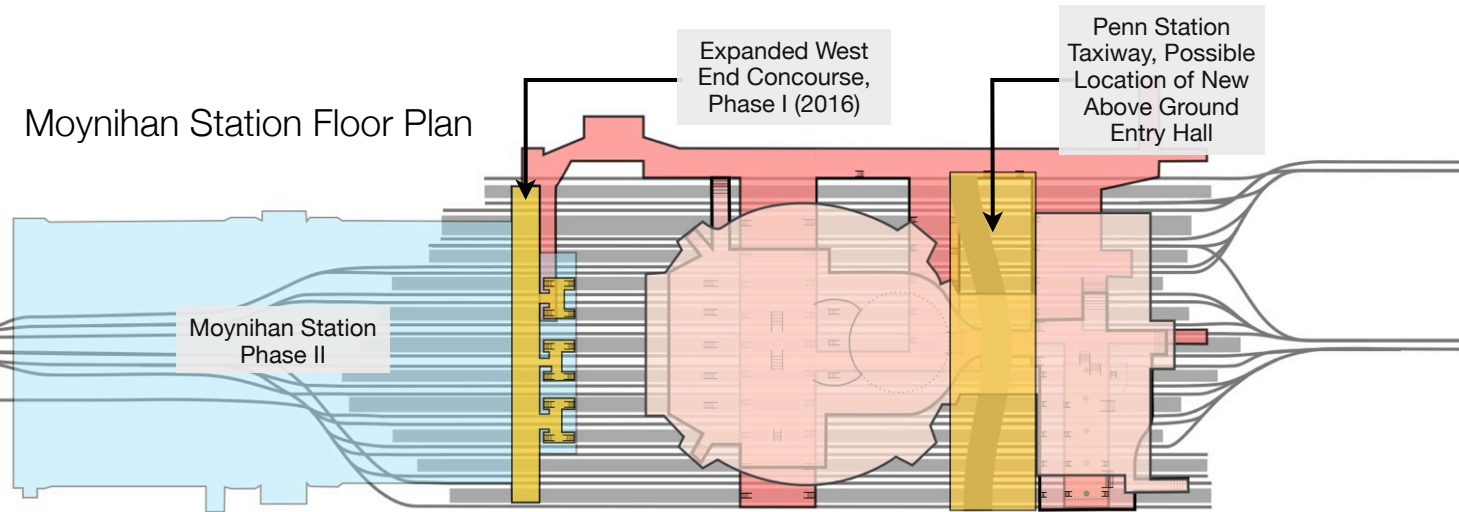


Moynihan Station, Phase I, West End Concourse Expansion



Moynihan Station, Phase II, Exterior

Moynihan Station Floor Plan



be attainable through creative adjustments and renovations to the existing Penn Station structure. For instance, Moynihan Station will contain a unified train hall that will provide access to select platforms. Penn Station does not currently enjoy a unified train hall, but not because it is technically infeasible. Amtrak, instead, has sectioned off the station into three independent concourses. By uniting these sections, and renovating existing space, the goal of creating a unified concourse would be reached without a costly move into the Farley Post Office. Moynihan Station will also

contain a high-ceilinged, open-air entry hall used to direct pedestrians from the street to their ultimate destination within the station. While it may seem that Penn Station is unable to create a high-ceilinged, open-air space due to the large structures that reside above it, there is indeed a large section of Penn Station that is not burdened by structural foundations from buildings above, the Penn Station Taxiway, which was permanently closed for vehicle traffic in 2001. And just as the Moynihan Station entry hall is planned to reside at the center of the block, a new Penn Station entry hall could also reside at the center of the block where the Penn Station taxiway is located.



Moynihan Station, Phase II, Entry Hall

Moynihan Station would help restore Penn Station to the cathedral of transit it once was, and its design would remedy many of the problems that cause overcrowding and unnecessary delay. However, Moynihan Station is a standalone proposal. It does not incorporate new mass transit connections, transit-oriented development, or perhaps most importantly, new cross-Hudson tunnels. Considering the scope of the region's transportation infrastructure challenges, New York and New Jersey require a much more expansive vision than what Moynihan Station currently offers.



Amtrak's Vision for High-Speed Rail, Proposed Alignments

Amtrak's Vision for High-Speed Rail

According to Amtrak's Vision for High-Speed Rail, by 2040, its next-generation high-speed rail service could be successfully developed in the northeast with sustained maximum speeds of 220 miles per hour, three-hour trip times between Washington and Boston, and an increase in overall train frequency. In comparison to the Acela Express, which currently runs along Amtrak's Northeast Corridor, the next generation of high-speed rail will chiefly be constructed on a new right of way. A number of possible rail alignments have been proposed, but no plans have been finalized, federal funding has not been secured, and construction on this long-term infrastructure project is years away.

Amtrak suggests that a new high-speed alignment travel through New York's Penn Station. Yet, it is unclear whether this stipulation is contingent on the construction of a new station or new, high-speed cross-Hudson tunnels. Further, it is unclear whether alternative stations would be considered for a future high-speed right of way, as the bulk of the analyzed alignment is outside of the Northeast Corridor. In the future, a high-speed right of way may integrate travel to an expanded Stewart International Airport in Orange County, NY. Or, as demonstrated by several proposed alignments, intermediate stations in Poughkeepsie, Hartford, or Worcester may be served, possibly by west-of-the-Hudson alignments traveling through Bergen and Rockland Counties. Regardless of the final alignment, planning remains in the very early stages and Amtrak is capable of incorporating Hudson Terminal into its Vision for High-Speed Rail. What is clear, however, is that no great high-speed rail network will ever travel through the current iteration of Penn Station.

No-Build Alternative

Regardless of what plan is ultimately adopted, maintaining the status quo for Penn Station, cross-Hudson tunnels, and West Side mass transit would be greatly detrimental to the region as a whole. Moving forward, as rail ridership continues to rise and the city grows, it is important to choose the most cost-effective, yet comprehensive, proposal available.

Comparison of Transit Proposals

	The Hudson Terminal Plan	The Gateway Project	Access to the Region's Core	7-Line to Secaucus
Estimated Cost / Construction Time	\$7.8 billion 8 Years	\$14.5 billion 15 Years	\$8.7 billion -	\$10 billion 10 Years
Cross-Hudson Tracks Added	4	2	2	2
Total Miles of New Track to New Jersey	0.8 miles	10.1 miles	9.3 miles	8.5 miles
Additional NJ Transit Trains per Peak-Hour	50	13	24	0
One-Seat Service for NJ Transit's Hoboken Division	Yes	No	Yes	No
One-Seat Service for NJ Transit's Hudson-Bergen Light Rail	Yes	No	No	No
Expansion of NYC Mass Transit Service	Yes	Yes	No	Yes
New Station Capacity (Tracks/Platforms)	26 Tracks 13 Platforms	7 Tracks 4 Platforms	6 Tracks 4 Platforms	3 Tracks 2 Platforms
New Street-Level Structure	Yes	Yes	No	No
Provisions for High-Speed Rail	Yes	Yes	No	No
Incorporates Real Estate Development	Yes	No	No	No
Chief Operating Agency	Port Authority	Amtrak	NJ Transit / Port Authority	MTA
Mandatory Increase in NJ Transit's Operations Budget	No	Yes	Yes	No
Requires Demolition of Private Property	No	Yes	No	No
New Rail Yard for NJ Transit / Amtrak	Yes	No	Yes	No

Potential Criticisms

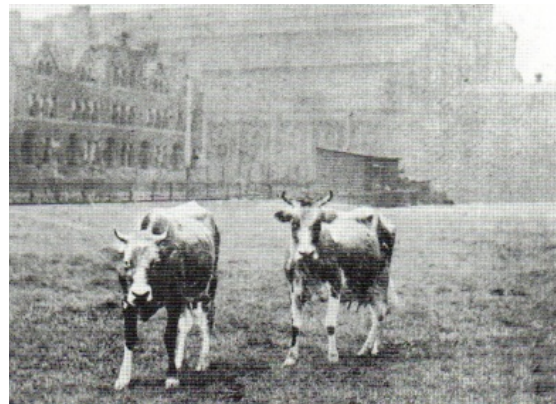
No comprehensive transit proposal will ever be perfect and tradeoffs are made to ensure that goals are prioritized appropriately. The following section will attempt to address several potential criticisms, explaining why certain choices were made in designing the Hudson Terminal Plan.

The Relative Importance of Station Location

One potential criticism of the Hudson Terminal Plan is the choice of location of Hudson Terminal at the western end of 14th Street, in a relatively unpopulated area of New York City. In addressing this potential issue, it is important to confront the premise of this criticism, that it is preferable to locate transit hubs within dense commercial districts. In 1871, when Grand Central Depot opened at the intersection of Park Avenue and 42nd Street, the city's central business district was miles south of the station. It was so far removed from the center of the city that cows roamed in pastures surrounding the station. Placing the station downtown would have, on its face, made more sense given the large number of businesses and residences located below 14th Street at the time. However, in doing so, there would have been no room to accommodate the 48 acres of underground tracks and platforms that the terminal's footprint would eventually occupy. Once Grand Central Depot opened its doors, the central business district began moving north. By the time it was replaced with Grand Central Terminal, it was clear that the transportation foundations for a vibrant business district were already laid and buildings began filling the surrounding blocks in the subsequent decades.



Grand Central Depot (1871)



Cows Roaming at 45th Street and Lexington Avenue (1870s)

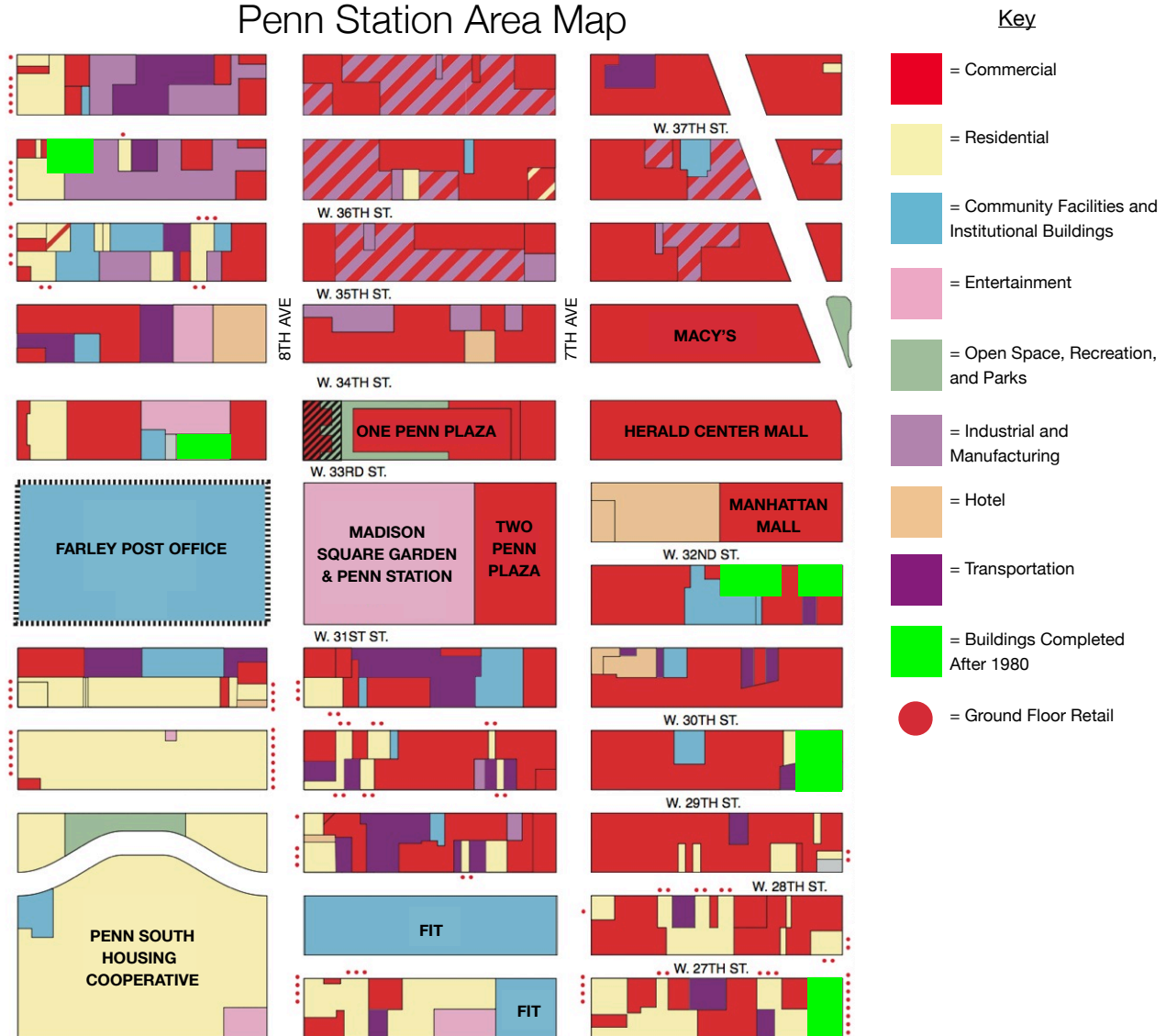


Penn Station Advertisement (1910)

The real reason for Grand Central Terminal's lasting success, however, is its incorporation of several mass transit connections. Prior to the subway system, elevated trains and light rail serviced Grand Central's predecessor stations. Eventually, the IRT Lexington Line, shuttle service to Times Square, and the IRT Flushing Line were built. Since most people traveling to Grand Central Terminal today do not reach their ultimate destination by walking, the availability of convenient mass transit connections has become much more significant in the station's long-term success than its location within a central business district. Transit hubs throughout the world have also thrived without residing in close proximity to dense commercial districts. For example, Paris's Gare du Nord—Europe's busiest rail station serving close to 200 million passengers annually—is not within walking distance of a single building taller than ten stories. It is, however, within walking distance to several key mass transit lines.

In the converse, just because a transit hub is placed in the center of a commercial district does not guarantee that it will endure lasting success. For instance, when the site for Penn Station was chosen, it was advertised as being in the center of New York's shopping, theater, and

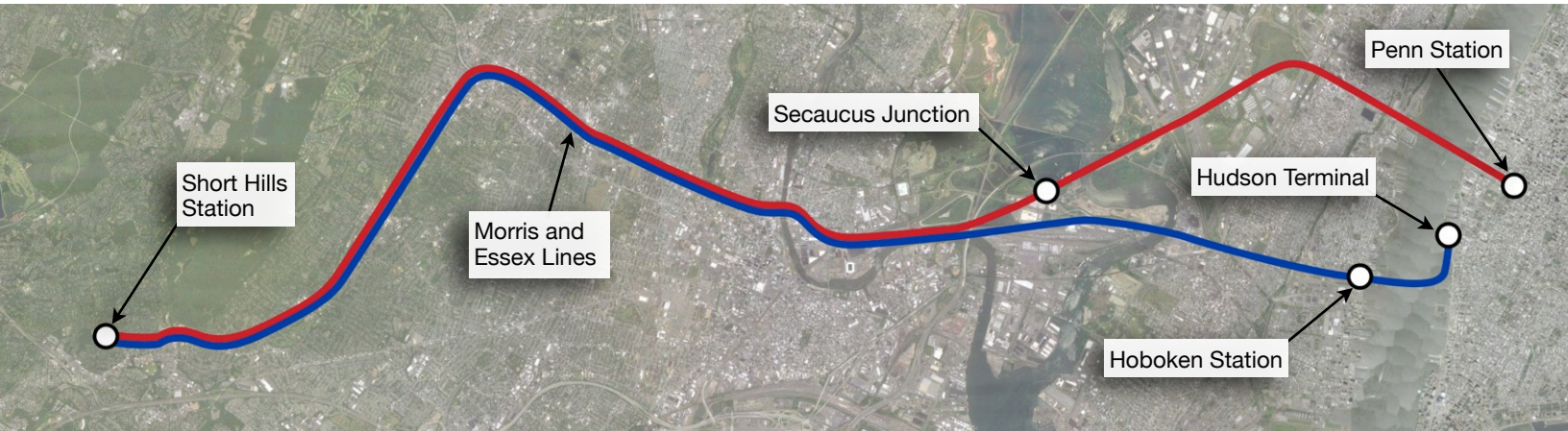
Penn Station Area Map



hotel district, and at the time, it was. However, growth in the blocks surrounding Penn Station has been sluggish for the greater half of the last century. The neighborhoods from 27th to 37th Street, 9th to 6th Avenue, have developed at a much slower pace than the Financial District, Civic Center, Midtown North, and Times Square, all of which are not within walking distance of a transit hub. New construction over the last 30 years has been few and far between, limited mainly to the 6th Avenue residential corridor. This lack of development, however, has not stopped Penn Station's ridership from growing. Instead, as is the case for Grand Central Terminal, the majority of people traveling to Penn Station connect to other modes of transportation to reach their ultimate destination. As the city's history has demonstrated, when selecting a location for a transit hub, it is far more important to provide convenient connections to mass transit lines that transport people to commercial districts than simply placing a transit hub in the center of an already bustling commercial district. The location of Hudson Terminal will provide NJ Transit and Amtrak riders access to several new mass transit options. The 7-Line Extension to Hudson Terminal will provide a one-seat ride to the new Hudson Yards business district, Times Square, Bryant Park, Grand Central Terminal, and Long Island City. Further, the L-Line Extension to Hudson Terminal will provide a one-seat ride to the 14th Street business district, Union Square, and Williamsburg, Brooklyn. In addition, by constructing Hudson Terminal on reclaimed land adjacent to a growing commercial district, as opposed to within an already established commercial district, there is both room to construct a robust station without having to raze private property and room in the surrounding neighborhoods for developers to plan new real estate opportunities.

Impact on Commuter Time

Another potential criticism of the location of Hudson Terminal is that it would lengthen commuter trips for those traveling by NJ Transit or Amtrak into Manhattan. At first glance, it may seem that a station placed farther away from the center of midtown would result in longer commuting times. However, there are two important considerations that prove this premise false. First, trains traveling along NJ Transit and Amtrak lines into Hudson Terminal would benefit from shorter trip times into Manhattan due to either the availability of a one-seat ride from points north or the ability to bypass the two-mile Secaucus Junction detour from points south and west. Second, once in Manhattan, Hudson Terminal will offer a more diverse selection of mass transit options for commuters since both the 7-Line and L-Line are crosstown routes.



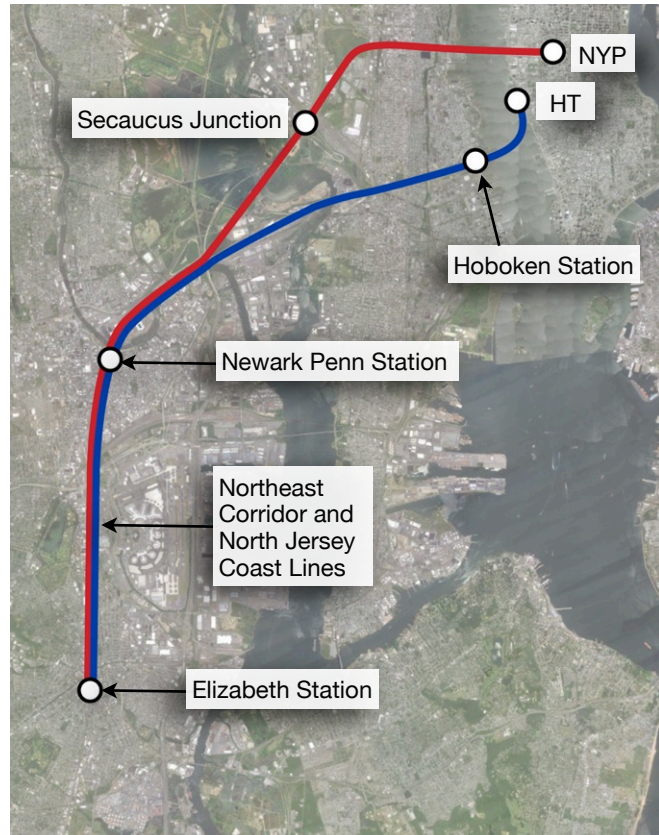
For example, based on published train schedules for the **Morris and Essex Lines**, it takes, on average, approximately 5 additional minutes to travel from Newark Broad Street station to Hoboken Terminal than to Secaucus Junction. In addition, it takes, on average, approximately 15 minutes to travel 5 miles from Secaucus Junction to Penn Station at an average speed of 20 miles per hour. At the same speed, it would take approximately 3 minutes to travel 0.8 miles from Hoboken Station to Hudson Terminal. Suppose a passenger wanted to travel from Short Hills, NJ to Manhattan at 7:30 AM on a weekday. According to NJ Transit train schedules, the total trip time to Penn Station would be 45 minutes, including 30 minutes from Short Hills, NJ to Secaucus Junction, and 15 minutes from Secaucus Junction to Penn Station. In contrast, the total trip time from Short Hills, NJ to Hudson Terminal would be 38 minutes (a difference of 7 minutes), including 35 minutes from Short Hills, NJ to Hoboken, and 3 minutes from Hoboken to Hudson Terminal. Once in Manhattan, using mass transit routes in existence as well as Phase I of the proposed West Side mass transit improvements, passengers would also enjoy faster commuting times to the majority of destinations as demonstrated in the chart below:

Average Weekday Travel Time (in minutes)*

From Short Hills, NJ	via Hudson Terminal	via Penn Station	Time Saved
...to Hudson Yards	43	56	13
...to Times Square	44	48	4
...to Grand Central Terminal	47	56	9
...to Rockefeller Center	47	57	10
...to Union Square	45	58	13
...to Wall Street	55	59	4
...to World Trade Center	54	58	4

* Travel Time Does Not Include Phases II or III of the West Side Mass Transit Improvements

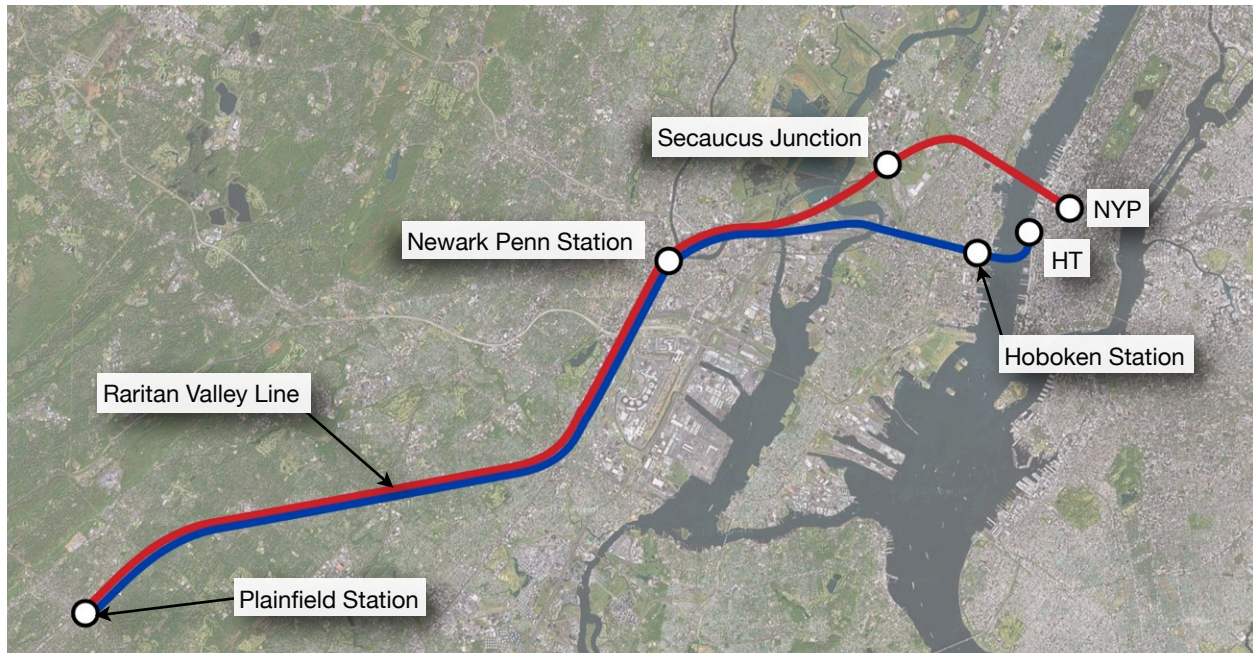
The **Northeast Corridor and North Jersey Coast Lines** provide direct service to New York Penn Station with intermediate service to Newark Penn Station and Secaucus Junction. These lines also provide periodic service to Hoboken by way of the single-track Waterfront Connection. Trains traveling from Newark Penn Station to New York Penn Station take an average of 21 minutes to travel 10.1 miles. Trains traveling from Newark Penn Station to Hoboken take an average of 22 minutes to travel 7.4 miles. This apparent discrepancy in speed, however, can be attributed to the fact that the only trains traveling to Hoboken along these lines are non-electric, diesel locomotives originating at stations south of Long Branch. Electric locomotives make up the majority of commuter rail locomotives and are ideal for commuter rail service with frequent stops. Compared with diesel locomotives, electric locomotives generally have a higher power output and can produce even higher short-term surge power for fast acceleration. This means that diesel locomotives, while not limited by maximum speed, nevertheless take longer amounts of time to accelerate and decelerate quickly, resulting in a longer travel time for short distances. Assuming, however, that the Northeast Corridor and North Jersey Coast Lines brought either electric or dual-powered locomotives to Hudson Terminal, the 7.4 mile trip from Newark Penn Station would take an average of 15 minutes. Adding the connection from Hoboken to Hudson Terminal, the total travel time from Newark Penn Station to Hudson Terminal would be approximately 18 minutes. Suppose a passenger wanted to travel from Elizabeth, NJ to Manhattan at 7:15 AM on a weekday. According to NJ Transit train schedules, the total trip time to Penn Station would be 34 minutes, including 13 minutes from Elizabeth, NJ to Newark Penn Station, and 21 minutes from Newark Penn Station to New York Penn Station. In contrast, the total trip time from Elizabeth, NJ to Hudson Terminal would be 31 minutes (a difference of 3 minutes), including 13 minutes from Elizabeth, NJ to Newark Penn Station, and 18 minutes from Newark Penn Station to Hudson Terminal.



Average Weekday Travel Time (in minutes)*

From Elizabeth, NJ	via Hudson Terminal	via Penn Station	Time Saved
...to Hudson Yards	36	45	9
...to Times Square	37	37	0
...to Grand Central Terminal	40	45	5
...to Rockefeller Center	40	46	6
...to Union Square	38	47	9
...to Wall Street	48	48	0
...to World Trade Center	47	47	0

* Travel Time Does Not Include Phases II or III of the West Side Mass Transit Improvements



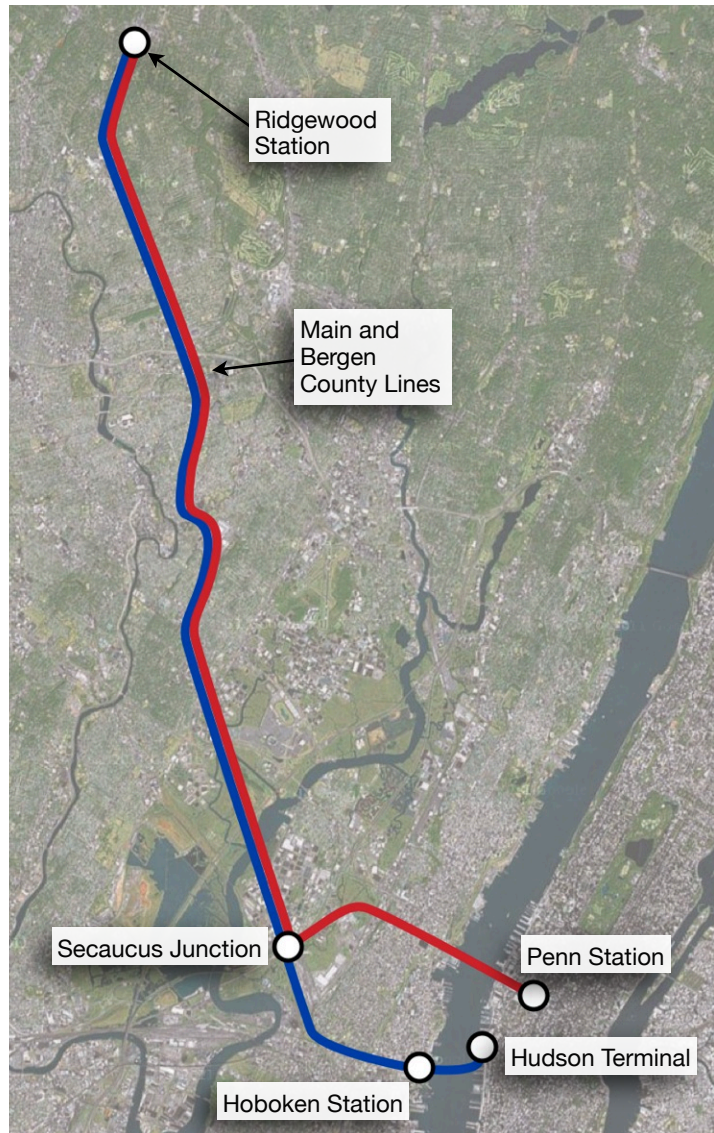
Up until early 2014, the **Raritan Valley Line** was unable to provide direct service to New York Penn Station for two primary reasons. The first reason was that New York Penn Station did not have the current cross-Hudson or Manhattan train capacity to support additional peak-hour, NJ Transit service from the Raritan Valley Line. Secondly, the Raritan Valley Line is not electrified and must utilize diesel locomotives, which are banned in the North River Tunnels and Penn Station. As part of the cancelled ARC project, NJ Transit purchased 35 dual-mode locomotives from 2008 to 2010, which are capable of operating on both electrified and non-electrified track. Today, five Raritan Valley Line trains travel into and out of New York Penn Station. However, because of ongoing capacity constraints, these trains can only operate during off-peak hours. Nevertheless, Raritan Valley Line service into Hudson Terminal would be feasible given the terminal's abundance of Manhattan trackage. Suppose a passenger wanted to travel from Plainfield, NJ to Manhattan at 8:00 AM on a weekday. According to NJ Transit train schedules, the total trip time to Penn Station would be 65 minutes, including 37 minutes from Plainfield, NJ to Newark Penn Station, a 7 minute transfer time, and 21 minutes from Newark Penn Station to New York Penn Station. In contrast, the total trip time from Plainfield, NJ to Hudson Terminal would be 55 minutes (a difference of 10 minutes), including 37 minutes from Plainfield, NJ to Newark Penn Station, and 18 minutes from Newark Penn Station to Hudson Terminal.

Average Weekday Travel Time (in minutes)*

From Plainfield, NJ	via Hudson Terminal	via Penn Station	Time Saved
...to Hudson Yards	60	76	16
...to Times Square	61	68	7
...to Grand Central Terminal	64	76	12
...to Rockefeller Center	64	77	13
...to Union Square	62	78	16
...to Wall Street	72	79	7
...to World Trade Center	71	78	7

* Travel Time Does Not Include Phases II or III of the West Side Mass Transit Improvements

Since both the **Main and Bergen County Lines** do not include direct service to Penn Station, passengers wishing to terminate in Manhattan must transfer at Secaucus Junction. During peak morning service, it takes an average of 21 minutes for passengers arriving at Secaucus Junction to travel to transfer trains and continue to Penn Station. If passengers stayed on the train instead of transferring, it would take an average of 12 minutes to travel from Secaucus Junction to Hoboken. Adding in the 3 minute trip time from Hoboken to Hudson Terminal, the average time saved for passengers traveling on the Main and Bergen County Lines to Hudson Terminal instead of Penn Station would be 6 minutes. In addition, like the Raritan Valley Line, the Main and Bergen Lines are not electrified, and would have to incorporate dual-mode locomotives to travel to Hudson Terminal. Suppose a passenger wanted to travel from Ridgewood, NJ to Manhattan at 6:30 AM on a weekday. According to NJ Transit train schedules, the total trip time to Penn Station would be 58 minutes, including 37 minutes to Secaucus Junction, a 6 minute layover, and 15 minutes from Secaucus Junction to Penn Station. In contrast, the total trip time from Ridgewood, NJ to Hudson Terminal would be 52 minutes (a difference of 6 minutes), including 49 minutes from Ridgewood, NJ to Hoboken Station, and 3 minutes from Hoboken Station to Hudson Terminal.



Average Weekday Travel Time (in minutes)*

From Ridgewood, NJ	via Hudson Terminal	via Penn Station	Time Saved
...to Hudson Yards	57	69	12
...to Times Square	58	61	3
...to Grand Central Terminal	61	69	8
...to Rockefeller Center	61	70	9
...to Union Square	59	71	12
...to Wall Street	69	72	3
...to World Trade Center	68	71	3

* Travel Time Does Not Include Phases II or III of the West Side Mass Transit Improvements

Choosing How to Invest in Transportation Infrastructure

Finally, critics are often unable to reconcile large public investments in transportation infrastructure with a lack of immediate quantifiable benefits. The thinking is that billions of dollars in should result in billions of dollars out. There is no question that investing in transportation infrastructure is a very expensive venture. However, just because benefits are not easily quantifiable does not mean that those benefits are not realized. In the first half of the 20th century, the large positive economic value derived from investments in transportation infrastructure was taken to be self-evident and major investments in commuter rail, highways, and other mass transit systems were made on this basis alone. As the city grew, these investments would end up transforming the region's economic and social landscape profoundly. Productivity and efficiency increased as goods and services were able to reach a broader population at a lower cost. Residents and visitors were able to travel faster to farther distances. And investment in unifying transportation networks spurred investment in the urban core. Yet, it has been over 50 years since the last Hudson River crossing—the lower level of the George Washington Bridge—was constructed. So instead of asking the question of whether to invest, the better question to ask is how to invest, and how to do so responsibly?

Responsible transit investments require that government agencies look beyond the immediate future when considering the scale of proposed improvements and the desired impact on affected populations. After all, it has been over a century since a cross-Hudson rail tunnel was built. To that end, minor increases in rail capacity will have only minor benefits for the growing population of rail travelers in the region. It is important to think big when making big capital contributions to the transportation infrastructure of the largest city in the nation. Further, responsible investments should seek to capitalize on as many ancillary benefits as possible, such as fueling the growth of Manhattan's West Side and the redevelopment of New Jersey's waterfront communities. Nevertheless, spending should be managed efficiently, taking into consideration how to achieve the broadest impact from minimal public funding commitments. Lastly,

transportation investments should restore pride in the region's already great transportation infrastructure. By creating an effective and modern transit network, overall confidence in the system would be lifted, which would serve as a competitive advantage for the region as a whole.



World Trade Center (1968), Site of Original Hudson Terminal

The Hudson Terminal Plan proposes several responsible investments in regional transportation infrastructure. Under the Hudson Terminal Plan, cross-Hudson rail capacity would triple, securing the success of NJ Transit and Amtrak for the next century. The City of Hoboken will be able to move forward with a redevelopment plan while incorporating new connections into Manhattan for New Jersey waterfront communities along the Hudson-Bergen Light Rail system. The construction of a new, premiere rail station in Manhattan will serve as the foundation for Amtrak's future high-speed rail network. And New Yorkers will see new mass transit improvements open up areas of Manhattan's West Side that have been underdeveloped for generations.

It may be difficult to predict with great specificity the return on a given infrastructure investment. It is, however, easy to imagine what New York would be like without great works of transportation infrastructure such as the New York City Subway system, Grand Central Terminal, or the Brooklyn Bridge. These great public works are intertwined with New York City's identity and have been critical to the growth of the economies of both the Garden State and the Empire State. In 2014, the City of New York stands at a crossroads, and the Hudson Terminal Plan is the bold transit proposal that will ensure New York and New Jersey's long-term prosperity.



New Pennsylvania Station is Opened

August 29, 1910 - New York Times

The largest building in the world ever built at one time, the Pennsylvania Railroad Station in New York, has just been completed and declared officially open. ...

In designing the exterior of the building, Messrs. McKim, Mead & White, the architects, were at pains to embody two ideas. To express in so far as was practicable, with the unusual condition of tracks below the street surface and in spite of the absence of the conventional train shed, not only the exterior design of a great railway station in the generally accepted form, but also to give to the building the character of a monumental gateway and entrance to a great metropolis. ...

The main waiting room on the concourse level is the largest in the world. Within its walls are located the ticket offices, baggage checking windows, and telephone and telegraph offices, so conveniently arranged that a passenger may proceed from one to the other with a minimum amount of exertion and without retracing his steps. ...

Indicative of the enormous growth in the population of the territory in and around New York City are figures contained in the company's pamphlet, which show that railroads on the western bank of the Hudson River opposite New York City carried in 1886, nearly 59,000,000 people. In 1890 they carried over 72,000,000, in 1896 more than 94,000,000, and in 1906 about 140,000,000.

Notes and Acknowledgements

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- Riverside Center images taken from Extell Development Company, © 2008
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- Hoboken Redevelopment Plan images taken from City of Hoboken, NJ, © 2012
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- Other materials taken from "Economic Returns from Transportation Investment," Eno Transportation Foundation Inc., Lansdowne, VA, © 1996
- Grand Central Terminal diagram taken from Richard E. Green, © 2009
- "Penn Station Delays Strand Commuters in the Cold," Wall Street Journal, © 2011
- "New Pennsylvania Station is Opened," New York Times, © 1910
- Penn Station ridership data taken from *Moynihan Station Development Project Environmental Assessment*, Empire State Development Corporation, © 2010
- NJ Transit historical ridership data taken from "N.J. Transit Relaxes Demands for Pay Cuts in Rail Walkout," New York Times, © 1983
- LIRR historical ridership data taken from "L.I.R.R. Ready for Renovation at Penn Station," New York Times, © 1983
- Economic impact data based in part on *Economic Benefits of the Trans-Hudson Express Tunnel*, NJ Transit, © 2006
- Information related to the demolition of private property as part of Amtrak's Gateway Project taken in part from "Midtown Block Would Likely Get Razed for 'Gateway Plan,'" DNAinfo.com, © 2011
- ARC financial data taken from *Potential Impacts and Cost Estimates for the Cancelled Hudson River Tunnel Project*, United States Government Accountability Office, © 2012

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Written by Matthew Handler, *President*

