

Transportation Challenges of Unbalanced Regional Growth



Introduction

While the New York City subways receive constant coverage in the media, the problems of trans-Hudson transit have not received comparable attention. This report provides a comprehensive assessment of how the New York-New Jersey region got to its present state of unbalanced growth and inadequate transit between New York City -- the portion of the region gaining the most jobs, by far -- and the northern New Jersey suburbs, which have substantial housing growth but are gaining relatively few jobs.

In the past eight years of economic recovery, New York City has experienced rapid employment gains, far outstripping previous levels of private employment at the peak of the business cycle. New York City has dominated regional growth in employment, but has not produced a sufficient number of housing units to provide for its expanded workforce. The city thus needs to import more workers from its suburbs. New Jersey, on the other hand, has built far more housing than it needed to support its modest increase in employment. It needs to export its working-age population, and has, in ever-increasing numbers, to New York City. In fact, one might describe working in New York City as northern New Jersey's largest and most important industry.

This convergence of interests -- in which New York City and northern New Jersey each supply the other's important needs -- runs up against the obstacle of the Hudson River, which must somehow be crossed for the New Jersey commuters to get to their jobs. The challenge of crossing the Hudson for work has long been daunting. By the end of the 19th Century an elaborate system of ferries brought commuters and intercity railroad passengers from New Jersey into Manhattan. In the early 1900's the Uptown and Downtown Hudson Tubes, now the PATH, provided fixed

subway links between Newark, Jersey City, Hoboken and Manhattan. In 1910 the North River tunnels connecting Newark to Pennsylvania Station in New York opened.

To this day, these are the last fixed rail links constructed across the Hudson River. This contrasts with the East River, where 18 subway tracks cross from Brooklyn and eight subway tracks and four commuter/intercity rail tracks cross from Queens. Moreover, Penn Station was conceived as primarily an intercity station, with narrow platforms and limited staircases and exits inadequate to handle large commuter train pedestrian volumes. The Pennsylvania Railroad's main commuter terminal in the early 1900's was at Exchange Place in Jersey City, where commuters could take the ferry or Hudson Tubes into Manhattan.

In the post-World War II era the focal point of Manhattan employment moved from Lower Manhattan to Midtown and New Jersey commuter transit adjusted with it. Beginning in the early 1960's a series of improvements connected what were formerly separate rail services to the New Jersey waterfront, operated by the Central Railroad of New Jersey and the Erie Lackawanna, to the Northeast Corridor Line and Penn Station in New York. In the same period, the Port Authority Bus Terminal, opened originally in 1950 at the Manhattan portal of the Lincoln Tunnel, was expanded twice, the last time in 1979. With the addition of ferries, which carry a relatively small volume of passengers, these are the transit services we have today.

By the mid-1990's transportation planners anticipated that the two North River tunnels would not be adequate for long-term rail commuter volumes. Thus was born the project known as Access to the Region's Core (ARC), which proposed two new rail tunnels from Secaucus, New Jersey into Manhattan, connecting to a new six-track station beneath West 34th Street between Eighth Avenue and Avenue of the

Americas. ARC was approved by the Federal Transit Administration in 2009. Construction began but the project was cancelled by New Jersey Governor Chris Christie in 2010.

ARC's cancellation, and the failure to offer any alternative proposal in its place, left New Jersey Transit with few options to respond to the inexorable upward trend in Manhattan rail commuters. Bus passengers through the Lincoln Tunnel, served by both NJ Transit and private operators, rose rapidly as well, overtaking the bus terminal's capacity even as its structure deteriorated and its obsolescence -- leading to an inability to handle larger-capacity buses or to provide accessibility to persons with disabilities at many gates -- became harder to work around.

The crisis of the North River tunnels became acute in 2012 when the tunnels were flooded by Hurricane Sandy. Salt water infiltration degraded the tunnels' concrete walls and will in the coming decades necessitate the closure of the tunnels for months at a time, to permit complete reconstruction. If Amtrak is required in an emergency to close one tunnel for repairs, peak inbound service may be limited to only six trains, a 75 percent reduction. Most NJ Transit rail passengers would need to find other means to get to work in Manhattan, likely improvised ferry or bus services that would result in far longer travel times and be highly disruptive on both sides of the Hudson.

At the beginning of 2018 slow-moving and uncertain planning processes were underway to address the ongoing trans-Hudson transit crises. In June 2017 the Federal Railroad Administration and NJ Transit issued a Draft Environmental Impact Statement for the Hudson Tunnel Project. The Hudson Tunnel Project is an outgrowth of Amtrak's Gateway plan, announced in 2011, which would construct two new rail tunnels under the Hudson, connecting with the existing Penn Station platforms and also with new platforms to be constructed on the block to the south of

existing Penn Station, bounded by West 30th and 31st Street, and Seventh and Eighth Avenues, as well as portions of the two blocks immediately to the east and to the west. To make the project more financially feasible, and to address the immediate need to rehabilitate the North River tunnels while preserving service, the Gateway plan has been bifurcated. The current Hudson Tunnel Project would be limited to the construction of two new rail tunnels providing access to the existing Penn Station platforms, with no capacity expansion. A second-phase capacity expansion would be possible but the construction horizon for such a project has been pushed far into the future.

In December 2017 a controversy erupted between the states of New York and New Jersey and the Trump administration concerning the current Administration's adherence to the previous Administration's non-binding commitment to fund 50 percent of the cost of the Hudson Tunnel Project, now estimated at \$13 billion. The Trump administration's response, and subsequent clarifications, threw the level of Federal funding commitment into confusion and highlighted the expectation that local funding will need to be a much larger percentage of the total than the states had anticipated.

At its December 2017 Meeting the Board of Commissioners of the Port Authority authorized, according to the minutes, "\$55 million for further planning and design activities for a new Port Authority Bus Terminal." An environmental and architectural and engineering consultant was subsequently selected, "so that environmental review activities can begin in 2018." While the Port Authority is committed to a full review of all alternatives for a new bus terminal, the most recent proposal shown to the Board would rebuild the bus terminal at its current location while maintaining full operations throughout the construction period. The construction schedule for a future bus terminal is unclear.

¹ Port Authority of New York and New Jersey, Board Minutes, December 6, 2017, <http://corpinfo.panynj.gov/documents/Board-Minutes/>, p. 6; contract award PMCPI7001, 12/29/17.

In early February 2017 the Port Authority issued a “Request for Proposals for the Performance of Expert Professional Planning Services and Evaluation of Long-Term Opportunities for Additional Trans-Hudson Rapid Transit Capacity”². This study commences long-range planning for trans-Hudson transportation improvements beyond the Gateway project and the Port Authority Bus Terminal replacement.

How did the region find itself faced with the need for multiple trans-Hudson transit megaprojects stretching out over decades? What are the benefits of advancing such a transportation agenda? Are there better alternatives?

2 http://www.panynj.gov/business-opportunities/pdf/RFPDOC_52219.pdf

Employment

Between the peak of the previous business cycle in 2008 and 2016, New York City recorded an increase in private employment of 497,226, or 15.9 percent (Table 1). This increase represented 79 percent of the private employment growth in the New York region in this period, despite New York City having only a 38 percent share of private employment at the beginning of the period. By the end of the period, New York City had 41 percent of the region's private jobs.

The rest of the New York region gained 133,894 private jobs, or 2.6 percent, in the 2008-2016 period. Gains were particularly small in the “inner” northern New Jersey counties (Bergen, Essex, Hudson, Middlesex, Morris, Passaic, Somerset and Union) and in the Connecticut portion of the region, at .5 and .6 percent, respectively. The lack of growth in the New Jersey counties is particularly significant because these counties send large number of commuters to Manhattan and the absence of employment opportunities nearer to home has resulted in large increases in these flows.

Other portions of the New York region performed better in gaining employment, although not as well as New York City. The “outer” northern New Jersey counties (Hunterdon, Mercer, Monmouth, Ocean, Sussex and Warren) and Long Island (Nassau and Suffolk) each recorded an increase of 5.6 percent in private employment in the 2008-16 period. The Lower Hudson (Putnam, Rockland and Westchester) and Mid-Hudson (Dutchess, Orange, Sullivan and Ulster) had increases of 3.5 and 4.1 percent, respectively.

Table 1: Change in Annual Average Private Employment, New York Region

	2008	Share	2016	Share	2008-2016 Change	%Ch
New York City	3,129,647	38%	3,626,873	41%	497,226	15.9%
NJ Inner	1,979,541	24%	1,990,091	22%	10,550	0.5%
NJ Outer	603,634	7%	637,306	7%	33,672	5.6%
Connecticut	740,698	9%	745,071	8%	4,373	0.6%
Long Island	1,035,863	13%	1,094,011	12%	58,148	5.6%
Lower Hudson	471,366	6%	487,723	6%	16,357	3.5%
Mid-Hudson	261,913	3%	272,707	3%	10,794	4.1%
Non-New York City	5,093,015	62%	5,226,909	59%	133,894	2.6%
Total	8,222,662		8,853,782		631,120	7.7%

Source: US Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages; compiled by NYC Department of City Planning

In 2016, despite having only 41 percent of overall private employment, New York City had the majority of regional employment in office-based Information and Financial Activities industry groups (Table 2). In contrast, the city had less than a proportionate share of Goods-Producing, Retail Trade and Wholesale Trade and Transportation industry groups.

From 2008 to 2016, New York City outperformed its suburbs in every major industry category, but several major groupings stand out (Tables 3 and 4). In goods-producing industries (construction and manufacturing), New York City lost three percent of jobs, but the rest of the region lost 11 percent, with the largest losses, both numerically and in terms of percentages, in the slow-growing New Jersey inner counties and in Connecticut. In the Information group, New York City gained 20,634 jobs, or 13.1 percent, while the rest of the region lost 32,911 jobs, or 23.4 percent. In the Financial Activities group, New York City lost 2,851 jobs, or

Table 2: Annual Average Private Employment, New York Region, 2016, by Industry Grouping

	Goods Producing	Retail Trade	Wholesale Trade and Transportation	Information	Financial activities	Professional and business services
New York City	217,541	344,246	265,871	177,614	455,026	683,147
NJ Inner	239,773	250,391	268,078	47,640	150,643	414,287
NJ Outer	67,166	104,423	43,659	13,027	41,675	101,818
Connecticut	102,669	100,849	52,486	17,861	57,772	114,258
Long Island	148,521	160,042	102,511	18,392	69,025	165,952
Lower Hudson	58,969	68,171	37,400	10,431	32,805	73,825
Mid-Hudson	38,510	49,052	23,366	4,623	11,346	28,068
Non-New York City	655,608	732,928	527,500	111,974	363,266	898,208
Total	873,149	1,077,174	793,371	289,588	818,292	1,581,355

	Education and health services	Leisure and hospitality	Other services	Unclassified
New York City	849,338	433,353	172,009	28,731
NJ Inner	349,133	181,099	80,681	8,365
NJ Outer	148,138	84,972	29,749	2,677
Connecticut	182,246	81,071	35,692	169
Long Island	245,932	120,988	54,450	8,196
Lower Hudson	120,031	54,011	28,339	3,742
Mid-Hudson	68,846	33,983	13,156	1,757
Non-New York City	1,114,326	556,124	242,067	24,906
Total	1,963,664	989,477	414,076	53,637

Source: US Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages; compiled by NYC Department of City Planning

Table 3: Change in Annual Average Private Employment, New York Region, 2008-16, by Industry Grouping

	Goods Producing	Retail Trade	Wholesale Trade and Transportation	Information	Financial activities	Professional and business services
New York City	(6,785)	47,199	4,503	20,634	(2,851)	101,511
NJ Inner	(47,369)	5,049	(11,177)	(11,843)	(18,822)	16,426
NJ Outer	(6,330)	1,540	3,870	(4,788)	(1,378)	7,942
Connecticut	(24,791)	(1,240)	(1,491)	(3,145)	(6,451)	5,124
Long Island	(5,892)	(1,021)	(1,042)	(7,238)	(4,726)	8,686
Lower Hudson	(8,465)	1,959	(2,463)	(4,838)	(2,450)	3,614
Mid-Hudson	(5,691)	294	150	(1,059)	(1,877)	1,822
Non-New York City	(98,538)	6,581	(12,153)	(32,911)	(35,704)	43,614
Total	(105,323)	53,780	(7,650)	(12,277)	(38,555)	145,125

	Education and health services	Leisure and hospitality	Other services	Unclassified
New York City	159,909	127,826	27,606	17,679
NJ Inner	44,725	27,207	6,344	10
NJ Outer	17,856	11,934	1,934	1,090
Connecticut	20,254	12,520	3,475	121
Long Island	37,293	22,773	4,837	4,477
Lower Hudson	13,749	10,987	2,151	2,112
Mid-Hudson	10,296	4,381	1,255	1,220
Non-New York City	144,173	89,802	19,996	9,030
Total	304,082	217,628	47,602	26,709

Source: US Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages; compiled by NYC Department of City Planning

six-tenths of one percent, while the rest of the region lost 35,704 jobs, or 8.7 percent. The largest numerical and percentage losses were again in the New Jersey inner counties and in Connecticut.

All areas of the region gained jobs in Professional and Business Services, but New York City's gains were much larger than those of the rest of the region, 17.5 vs. 7.5 percent. Gains were also universal in Education and Health, Leisure and Hospitality, and Other Services, but New York City's dominance over the period was less dramatic in these sectors.

Table 4: Percentage Change in Annual Average Private Employment, New York Region, 2008-16, by Industry Grouping

	Goods Producing	Retail Trade	Wholesale Trade and Transportation	Information	Financial activities	Professional and business services
New York City	(3.0%)	+15.9%	+1.7%	+13.1%	(0.6%)	+17.5%
NJ Inner	(16.5%)	+2.1%	(4.0%)	(19.9%)	(11.1%)	+4.1%
NJ Outer	(8.6%)	+1.5%	+9.7%	(26.9%)	(3.2%)	+8.5%
Connecticut	(19.5%)	(1.2%)	(2.8%)	(15.0%)	(10.0%)	+4.7%
Long Island	(3.8%)	(0.6%)	(1.0%)	(28.2%)	(6.4%)	+5.5%
Lower Hudson	(12.6%)	+3.0%	(6.2%)	(31.7%)	(6.9%)	+5.1%
Mid-Hudson	(12.9%)	+0.6%	+0.6%	(18.6%)	(14.2%)	+6.9%
Non-New York City	(11.0%)	+3.0%	(0.3%)	(23.4%)	(8.7%)	+7.5%

	Education and health services	Leisure and hospitality	Other services	Unclassified
New York City	+23.2%	+41.8%	+19.1%	+160.0%
NJ Inner	+14.7%	+17.7%	+8.5%	+0.1%
NJ Outer	+13.7%	+16.3%	+7.0%	+68.7%
Connecticut	+12.5%	+18.3%	+10.8%	+252.1%
Long Island	+17.9%	+23.2%	+9.7%	+120.4%
Lower Hudson	+12.9%	+25.5%	+8.2%	+129.6%
Mid-Hudson	+17.6%	+14.8%	+10.5%	+227.2%
Non-New York City	+16.1%	+22.5%	+10.6%	+136.9%

Source: US Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages; compiled by NYC Department of City Planning

In 2017, New York City continued to gain jobs at a faster rate than the suburban counties. As of March 2018, the U.S. Bureau of Labor Statistics had published preliminary county employment statistics up to the third quarter. In the third quarter of 2017, average New York City private employment increased by 2.24 percent, compared with the third quarter of 2016. Suburban increases ranged from 1.02 percent on Long Island to 1.8 percent in the Mid-Hudson area. In the New Jersey Inner Counties area, average private employment increased by 1.22 percent. The Connecticut suburban counties recorded a small private employment loss.³

3 U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

Housing

In contrast with employment, where four out of five new jobs in the 2008-2016 period were in New York City, a majority of new housing permits were outside the city (Table 5). Of a total 396,897 housing units receiving permits, 176,851, or 45 percent, were in the city while 220,046 were elsewhere in the region. More than half -- 110,239 -- of the non-New York City permits were from the northern New Jersey inner counties, where employment growth was slow. The next greatest number, 39,790, were in the northern New Jersey outer counties. Areas north and east of New York City had relatively modest housing growth. Moreover, the great majority of units permitted in buildings with three or more units were in New Jersey, with Connecticut also providing a significant share.

In 2017, northern New Jersey alone outstripped all of New York City as a source of new building permits. Northern New Jersey had 23,603 new units permitted, of which 17,738 were in the inner counties and 5,865 in the outer counties. In contrast, New York City had 22,131 new housing units permitted.⁴ The imbalance between New York City-centered employment growth and housing growth more evenly divided between New York City and northern New Jersey has created a large increase in trans-Hudson commuting into Manhattan.

⁴ U.S. Census Bureau, *Building Permits Survey*, <https://www.census.gov/construction/bps/>, U.S. counties year-to-date through December 2017.

Table 5: New Housing Permits, New York Region, 2008-16

	Units Receiving Permits	Share of Units Permitted in Region	3+ Units in Building	Share of 3+ Units in Building	Share of Units Permitted in Region in 3+ Unit Buildings
New York City	176,851	45%	164,987	93%	58%
NJ Inner	110,239	28%	75,463	68%	27%
NJ Outer	39,790	10%	12,370	31%	4%
Connecticut	25,170	6%	12,993	52%	5%
Long Island	17,945	5%	4,569	25%	2%
Lower Hudson	9,918	2%	5,723	58%	2%
Mid-Hudson	16,984	4%	6,433	38%	2%
Non-New York City	220,046	55%	117,551	53%	42%

Source: U.S. Census Bureau, Building Permits Survey; compiled by NYC Department of City Planning

Transportation

The 2006-10 Census Transportation Planning Package, based on five years of American Community Survey samples, estimated 10,246,038 workers in the New York region, of whom 4,185,712 worked in New York City (Table 6). About 80 percent of New York City workers lived in the city. Of those who commuted from outside the city, the largest shares came from Long Island and the New Jersey inner counties, 6.6 and 7.2 percent, respectively.

Manhattan was more reliant on non-New York City residents, at 26.9 percent, compared with 20.3 percent for the city as a whole (Table 7). The New Jersey inner counties and Long Island were also the most important areas of origin for suburban commuters into Manhattan, at 11 and 5.8 percent of workers, respectively.

The Census Transportation Planning Package is updated only once a decade. The Census Bureau models annual changes in commuter flows based on changes in employment.⁵ For 2015, the Census model estimates that the number of New Jersey residents with primary jobs in Manhattan had increased to 298,935, or 13.3 percent of Manhattan workers.

⁵ U.S. Census Bureau, OnTheMap Application, Longitudinal-Employer Household Dynamics Program. <http://onthemap.ces.census.gov/>.

Table 6: New York City Workers by Area of Residence, Census Transportation Planning Package, 2006-10

	Number of Workers	Percent of NYC Workers
New York City	3,337,908	79.7%
NJ Inner	301,164	7.2%
NJ Outer	50,304	1.2%
Connecticut	36,452	0.9%
Long Island	277,931	6.6%
Lower Hudson	152,472	3.6%
Mid-Hudson	29,481	0.7%
Non-New York City	847,804	20.3%

Table 7: Manhattan by Area of Residence, Census Transportation Planning Package, 2006-10

	Number of Workers	Percent of NYC Workers
New York City	1,701,895	73.1%
NJ Inner	255,960	11.0%
NJ Outer	38,235	1.6%
Connecticut	31,440	1.4%
Long Island	135,650	5.8%
Lower Hudson	101,875	4.4%
Mid-Hudson	19,265	0.8%
Non-New York City	624,868	26.9%

Source: U.S. Census Bureau, American Community Survey, compiled by NYC Department of City Planning

Table 8: Hub Bound Travel on a Fall Business Day, Persons by Major Suburban Transit Modes and Gateways, 2008 and 2016, 6-10 a.m.

	2008	2016	Change	Percent Change
New Jersey Transit Rail	46,371	63,509	17,138	37.0%
Lincoln Tunnel Bus	99,515	110,996	11,481	11.5%
PATH	68,482	77,986	9,504	13.9%
Metro-North Railroad	73,805	77,084	3,279	4.4%
Long Island Railroad	86,980	84,180	-2,800	-3.2%

Source: New York State Metropolitan Transportation Council, Hub Bound Travel

Another source of data on the underlying trends in the current decade for the Manhattan Central Business Districts is survey data on commuter flows. The Hub Bound Travel surveys conducted annually, on a typical fall business day, by the New York Metropolitan Transportation Council provide a consistent measure of the numbers of people coming into the Manhattan “hub,” the area south of 60th Street, by area of origin and travel mode. Since most people arrive in Manhattan by transit, the major transit modes provide the best indication of changes in areas of origin for commuters.

From the last business cycle peak in 2008 to 2016, the last year for which data are published, large increases in hub-bound passengers were recorded for New Jersey Transit trains; buses bound through the Lincoln Tunnel, most of which originate in New Jersey and are headed for the Port Authority Bus Terminal; and PATH. A more modest increase occurred for Metro-North rail, and the Long Island Railroad actually declined.

The unbalanced growth of commuter traffic, with New Jersey experiencing much more rapid increases in commuter rail and bus commuters than other suburban gateways to Manhattan, makes Manhattan more dependent on New Jersey resident workers, as New Jersey residents become at the same time more dependent on Manhattan for employment.

This underlying trend is well-understood by transportation agencies. In January 2016, as part of its planning efforts for the replacement of the Port Authority Bus Terminal with a modern facility, the Port Authority of New York and New Jersey produced updated forecasts for trans-Hudson commuter rail and bus traffic for 2020, 2030 and 2040.⁶

While these forecasts are the most recent available publicly, they are based on what may be an unduly conservative projection of Manhattan and overall New York City employment growth, given that the 2011-12 base year for the forecast is before the decade’s strong growth trend was fully apparent. The Midtown Bus Master Plan model projects that New York City will have 46.6 percent of regional employment growth

⁶ Port Authority of New York and New Jersey, Midtown Bus Master Plan, Appendix B, Bus & Passenger Activity Forecasts, January 5, 2016.

Table 9: Trans-Hudson Forecasts by Transit Mode, MBMP Planning Forecast, AM Peak Period Inbound

Trans-Hudson Mode	MBMP Forecast					Cumulative Change			
	2010	2020 No-Build	2020	2030	2040	2010-20NB	2010-20	2010-30	2010-40
NJ Transit Rail	42,838	55,933	53,625	57,888	65,359	30.6%	25.2%	35.1%	52.6%
PATH - 33rd St. Branch	34,652	39,256	25,826	27,612	30,709	13.3%	-25.5%	-20.3%	-11.4%
PATH - WTC	35,210	44,698	63,928	70,366	78,616	26.9%	81.6%	99.8%	123.3%
Bus - PABT	75,562	91,157	88,093	95,942	109,560	20.6%	16.6%	27.0%	45.0%
Bus - Non-PABT	8,307	10,970	10,617	10,338	11,669	32.0%	27.8%	24.4%	40.5%
Ferries	4,218	4,508	4,652	5,102	5,656	6.9%	10.3%	21.0%	34.1%
Total	200,788	246,523	246,740	267,248	301,569	22.8%	22.9%	33.1%	50.2%

Source: Port Authority of New York and New Jersey, Midtown Bus Master Plan, Appendix B, Bus & Passenger Activity Forecasts, January 5, 2016, p. 12. According to this document, “The 2020 “no build” scenario provides a pure growth forecast by removing the effects of the World Trade Center PATH Transit Hub, communications based train control on PATH, the Dey St. passageway to the Fulton Transit Center, the reopening of the Cortlandt Street Station on the #1 subway line, and the #7 extension to the Far West Side, among others.”

between 2010 and 2020 and 43.7 percent between 2010 and 2040⁷ when, as noted above, New York City has in fact received a much greater share of post-recession job growth (79 percent) between 2008 and 2016. If New York City continues to dominate regional employment growth, the potential trans-Hudson commuter rail and bus passenger growth could be higher.

⁷ Ibid., p. 5

Table 10: MBMP Passenger Forecasts, AM Peak Period Inbound, Change vs. No Build

Trans-Hudson Mode	MBMP Forecast	
	35 TPH	44 TPH
NJ Transit Rail	10.0%	23.3%
PATH	-2.5%	-5.9%
Bus - PABT	-1.2%	-4.0%
Bus - Non-PABT	0.0%	-0.6%
Ferries	-0.4%	1.3%
Total	0.8%	1.4%

Source: Port Authority of New York and New Jersey, Midtown Bus Master Plan, Appendix B, Bus & Passenger Activity Forecasts, January 5, 2016, p. 18.

According to the Port Authority's forecast, trans-Hudson peak period regional passenger travel (not including intercity buses and trains) could grow by just over 100,000, or 50.2 percent between 2010 and 2040, with the largest numerical increases in NJ Transit Rail, PATH service to the World Trade Center and buses to the Port Authority Bus Terminal (Table 9). PATH growth would mainly reflect improvements already underway.

Some of the PATH and bus passengers in the Port Authority's forecast discussed above are assumed to have been diverted from NJ Transit commuter rail, due to capacity constraints on the lines leading into Penn Station. The Port Authority analysis thus models the possible effect of additional NJ Transit service as a result of the construction of proposed two new tunnels and additional platform capacity at Penn Station (Table 10). The analysis considers two levels of improved service, based on the extent of additional improvements to rail infrastructure in New Jersey; 35 and 44 trains per hour, respectively. The scenario results in a shift of Manhattan-bound peak passengers to NJ Transit Rail, mainly from buses and PATH, and a small increase in peak period passengers overall.

What the Data Show

By 2016, New York City had 41 percent of the region's private employment, but a disproportionately high share (49 percent) of office-based jobs, representing many of the highest-paying occupations and attracting the best-educated workers. Since the last business cycle peak in 2008, the city had all of the job gains in the region in the Information industry grouping, over two-thirds of the gains in Professional and Business Services, and only a small loss of jobs in Financial Activities.

The consequence of the city's increasing dominance of these industries was that particularly in northern New Jersey, the portion of the region outside New York City that had the greatest housing growth, residents were inclined in growing numbers to seek employment in New York City. As a recent report states, "the flow of people into the high-paying Manhattan economy plays an ever-increasing part in New Jersey's well-being."⁸ At the same time, New York City's New Jersey workers are also taxpayers in New York State and City. A recent commentary, citing data from the New York State Division of Taxation and Finance, noted that New Jersey nonresident workers, most of whom work in the city, paid \$3.1 billion in New York State income taxes in 2014, the latest year for which data are available. New Jersey residents also pay city and state sales taxes on purchases in the city, and those who are self-employed or partners in unincorporated businesses may be required to pay New York City's Unincorporated Business Tax.

...New York's New Jersey taxpayers ... gain access to the nation's largest concentration of high-paying jobs, not to mention a lucrative market for a wide range of professional and business services. By the same token, however, New Jersey repays the favor by housing (and providing public services to) hundreds of thousands more skilled professionals, managers, and other workers than could be accommodated at equally affordable prices in New York City, Long Island, or the lower Hudson Valley. In sum, New Jersey provides both a discount dormitory for Manhattan employers and a revenue engine for Albany...⁹

8 Fund for New Jersey, "Transportation Must Again Be the Backbone of New Jersey Economy," <http://www.fundfornj.org/sites/default/files/crossroadsnj/TRANSPORTATION%209-13-17.pdf>.

9 E.J. McMahon, "Why N.J. commuters are N.Y.'s economic development cash cows", http://www.nj.com/opinion/index.ssf/2017/08/why_nj_commuters_subsidize_nys_economic_developmen.html.

This mutual dependency gives the city and state of New York, and the state of New Jersey, a community of interest in ensuring reliable and fast commuter transportation across the Hudson. Notwithstanding this obvious fact, trans-Hudson commuting is in crisis. No systematic time-series data are published on capacity utilization on commuter rail and bus networks in New Jersey, the fastest-growing commuter transportation modes. However, there is considerable anecdotal evidence, from media investigations, that both are overused and unreliable, and in addition, New Jersey Transit has been subject to financial and administrative shortcomings that have further impaired its ability to serve its customers.¹⁰

For purposes of developing its model, the Port Authority Midtown Bus Master Plan assumed a peak-hour maximum passenger capacity in NJ Transit’s rail network of 27,150.¹¹ By 2016, on a typical fall business day the 8-9 a.m. peak passenger load was 28,675¹², or more than the theoretical maximum, and there has likely been more growth since then.

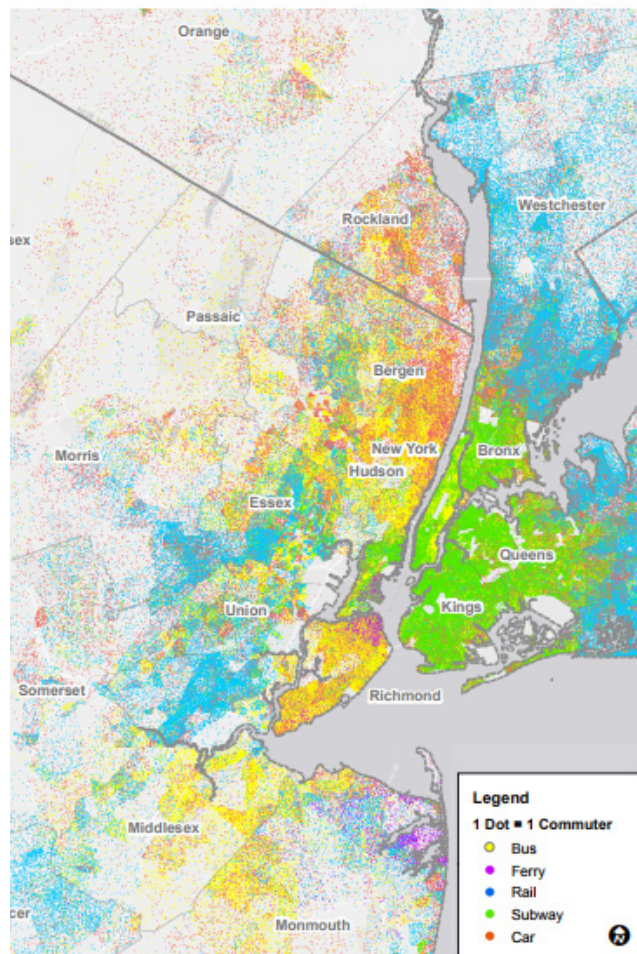
As the NJ Transit passenger rail system has come under increasing strain, more passengers have also chosen to commute by bus. As shown by Figure 1, from the Port Authority’s 2016 Trans-Hudson Commuting Capacity

10 See Emma G. Fitzsimmons and Patrick McGeehan, “New Jersey Transit, a Cautionary Tale of Neglect,” <https://www.nytimes.com/2016/10/14/nyregion/new-jersey-transit-crisis.html>; “Investigation: The Personnel, Safety and Financial issues That Have Plagued NJ Transit,” <https://www.northjersey.com/story/news/watchdog/2017/11/30/nj-transit-investigations-look-into-issues-affecting-agency/909002001/>.

11 Ibid., p. 11

12 https://www.nymtc.org/Portals/0/Pdf/Hub%20Bound/2016%20Hub%20Bound/DM_TDS_Hub_Bound_Travel_2016-FINAL.pdf, p. III-25.

Figure 1: Mode Split by Origin for Commuters Working in Manhattan



Source: Port Authority of New York and New Jersey, Trans-Hudson Commuting Capacity Study, Summary Report, September 2016, https://www.panynj.gov/about/pdf/Trans-Hudson_Commoting_Capacity_Study-Summary_Report_9-21-16.pdf. Data are from U.S. Bureau of the Census, American Community Survey, 2006-10 Special Tabulation: Census Transportation Planning

Study, New Jersey commuters are primarily divided into bus and train markets, based on where the train lines run.

However, there is some ability for commuters to choose between modes, and the Midtown Bus Master Plan passenger forecast has commuters switching to buses as trains reach capacity. By early 2015, the Port Authority was acknowledging in a presentation to its Board of Commissioners, that at the Midtown Manhattan bus terminal, “current peak demand exceeds capacity and spills over onto city streets” and “queuing buses affect air quality and generate traffic congestion.”¹³ The agency forecast a 35 to 51 percent increase from the base year of 2011 to 2040 in the number of PM peak period (5-6 p.m.) passengers, or 28,000 up to as much as 42,000, necessitating a substantial increase in terminal capacity. The presentation also noted additional problems with the existing terminal:

- The structural slabs supporting bus operations will need to be replaced in 15-25 years.
- Terminal was not built for taller, longer, heavier modern buses.
- Inadequate bus parking, staging, circulation space.

It recommended full replacement of the terminal.¹⁴

13 <http://corpinfo.panynj.gov/documents/Update-on-Midtown-Bus-Master-Plan-2/>
14 Ibid.

Causes of Regional Jobs Imbalance

In principle, one alternative to building major new transit infrastructure to accommodate a continued surge in New Jersey commuters into New York would be to increase job growth in New Jersey. Keeping New Jersey's growing professional, technical and managerial labor force in New Jersey, to a greater extent than at present, would take pressure off trans-Hudson transit. More employment growth in transit-accessible locations in New Jersey's inner counties would also, by attracting New York resident workers, better utilize reverse-commuting capacity. At one time, New York City genuinely feared an outflow of its best-paying jobs to New Jersey, and created policies in response, including a notorious newspaper advertisement featuring Mayor Ed Koch boarding up the Holland Tunnel.¹⁵ In the current decade the trend has reversed entirely. New Jersey office markets are characterized by double-digit vacancy rates and asking rents far below nearby Manhattan.¹⁶

Prescriptions to remedy New Jersey's slow job growth are many and varied. Opportunity NJ, a nonprofit coalition of business and government leaders, held an Affordability Summit in September 2017. The conference's theme was premised on the view that high taxes and expensive public services were holding the state back. This view was supported by a presentation by Tom Byrne, Managing Partner of Byrne Asset Management and Chairman of the NJ State Investment Council. Byrne argued that New Jersey's public services were much more expensive than in comparable states and that to escape long-term economic stagnation, costs needed to be brought into line, so that taxes could be more competitive.¹⁷ In contrast, a report prepared by McKinsey & Company, *Reseeding the Garden State's Economic Growth: A Vision for New Jersey* focused more on pro-growth governmental activism that could increase spending or provide more favorable tax incentives. The report recommends that New Jersey:

- Support young, growing companies by creating incubators and other support services; facilitating access to venture capital, possibly through new tax credits; and streamlining regulatory procedures.
- Improve infrastructure by making capital spending more efficient, investing in new rail capacity, considering congestion pricing and promoting transit-oriented development;
- Address workforce imbalances through increased apprenticeship programs, expanded education and training programs and financial support for occupational training; and
- Tailor incentives for growth by de-emphasizing aid to legacy firms, focusing more on growing companies and foreign investment, and better tracking outcomes.¹⁸

These prescriptions, even if embraced by the state government, may in many cases be difficult to implement, both because of entrenched interest groups and the fiscal stringency the state faces. Perhaps the easiest of these recommendations -- apparently, since New Jersey is already doing this -- is to streamline regulatory procedures and promote transit-based growth. Thus far, the state has been far more successful at promoting housing than office development. In this, it is similar to New York City, whose rezoning plans for the peripheral business districts in Downtown Brooklyn and Long Island City, instituted in response to the

15 The ad appeared in The New York Times, July 23rd, 1987, p. D6.

16 Contrast, e.g., Cushman & Wakefield, Marketbeat Northern New Jersey, Office Q4 2017, and Marketbeat Manhattan, Office Q4 2017.

17 Tom Byrne, "Taxes, Pensions, and Affordability," Powerpoint presentation, downloadable at <http://opportunitynj.org/platforms/>.

18 <https://www.mckinsey.com/~media/McKinsey/Global%20Themes/Employment%20and%20Growth/Reseeding%20growth%20in%20the%20Garden%20State/Reseeding-the-Garden-States-economic-growth-A-vision-for-New-Jersey.ashx>

“Group of 35” report in 2001,¹⁹ set off residential development booms but produced comparatively little new office development. The City of New York remains committed to office development in Downtown Brooklyn and Long Island City²⁰, and will need to recalibrate its land use policies to achieve a more balanced mix of workspace and housing, taking pressure off the subway lines under the East River, many of which are as capacity-constrained as NJ Transit trains and the Port Authority Bus Terminal. The state of New Jersey and the municipalities that control land use can evaluate the successes and failures of New York City’s policies in peripheral business districts outside Manhattan and emulate the policies that have worked, including modernization and adaptive reuse of former industrial buildings, density increases, mixed-use zoning, streetscape improvements, and transit upgrades. One such example, modeled on New York City projects such as the Brooklyn Navy Yard, is Kearny Point, the redevelopment of a former shipyard to an office and industrial park.²¹ The property is accessible by a short local bus ride from Newark’s Penn Station.

A second means of mitigating the need for major new trans-Hudson transportation investments is to increase housing construction on the east side of the Hudson River, in New York City and its northern and eastern suburbs. A 2017 Regional Plan Association study notes region-wide opportunities for transit-oriented multifamily housing development near commuter rail stations.²² Such development in many cases would require zoning changes that currently lack political support in suburban municipalities. In New York City, the zoning environment is more complex. Large areas are zoned for dense housing, but new construction of apartment buildings in appropriate locations well-served by transit is often hindered by unduly restrictive zoning. Changes to zoning that would allow more housing to be built also face a difficult political environment.²³

In the final analysis, while this report will focus specifically on trans-Hudson transportation, the region’s land use planning, economic development and transportation agencies, as well as elected officials, need to address future growth with a multifaceted approach.

19 *Preparing for the Future: A Commercial Development Strategy for New York City*, Group of 35 Final Report, June 2001, <https://www.scribd.com/document/118950748/Group-of-35-Report-June-2001>

20 City of New York, *New York Works: Creating Good Jobs*, June 2017, pp. 88-89, <https://newyorkworks.cityofnewyork.us/>

21 C.J. Hughes, “After the Launching (and Scrapping) of Navy Ships, a New Mission,” *The New York Times*, December 26, 2017, <https://www.nytimes.com/2017/12/26/business/navy-shipyard-kearny.html>.

22 *Untapped Potential: Opportunities for Affordable Homes and Neighborhoods near Transit*, <http://library.rpa.org/pdf/RPA-Untapped-Potential.pdf>.

23 See, e.g., Norman Oder, “Inside the Battle over the Megaproject at 80 Flatbush,” *The Bridge Brooklyn Business News*, April 1, 2018, <https://thebridgebk.com/inside-battle-over-megaproject-80-flatbush/>.

Current planning efforts to improve trans-Hudson transit are focused on the Hudson Tunnel Project, which would construct two new rail tunnels beneath the Hudson River, and the replacement of the Port Authority Bus Terminal with a new terminal, adequately sized for future passenger volumes and meeting contemporary operational and safety needs.

Hudson Tunnel Project

Pennsylvania Station in New York was built in the early 1900's to serve areas west of the Hudson primarily as an intercity station. The original plans for the lower level of the station, now the commuter level, had a limited number of exit stairs for the platforms at the center and southern portions of the station, used primarily by trains from the two North River tunnels beneath the Hudson. These stairs were located at the Exit Concourse beneath the train hall at the west end of the station.²⁴ The limited number of exit stairs indicated that trains were expected to have relatively few passengers and plenty of time to load and unload. The Pennsylvania Railroad's primary commuter terminal was at Exchange Place in Jersey City. The station was designed so that passengers could transfer directly to ferries to Lower Manhattan, in the early 1900's the primary business district in Manhattan. The Hudson & Manhattan Railroad, later the PATH, provided a subway connection as well.²⁵ However, Penn Station itself provided an impetus for shifting the focus of New York's central business district to Midtown, and by the early 1960's the Jersey City terminal was closed and demolished.

By the 1960's more stairs had been provided for Long Island Railroad customers, but a pamphlet showing the layout of the commuter level still had limited stairs in the southern half of the station, serving New Jersey.²⁶ Nonetheless a series of improvements connected other commuter railroads to the Northeast Corridor permitting trains to access Penn Station directly. In 1967 the Central Railroad of New Jersey's terminal in Jersey City was closed, and the Raritan Valley and North Jersey Coast Lines connected to the Northeast Corridor. In 1996 and 2002, former Erie Lackawanna lines serving areas north and west of Newark were connected into Northeast Corridor (the Midtown Direct services).²⁷ However, not until NJ Transit opened its 7th Avenue concourse in 2002²⁸ was Penn Station adapted to full utilization of the capacity of the Hudson River tunnels for commuter trains.

By the mid-1990's it had become apparent to the region's transportation agencies that, creative as these solutions were to accommodate the growing need for trans-Hudson commuting, more rail capacity was necessary from New Jersey to New York. Thus NJ Transit, the Port Authority and the MTA began to study alternatives for what became the project known as Access to the Region's Core, or ARC, which was ultimately approved by the Federal Transit Administration in early 2009²⁹. ARC began construction but was cancelled by former New Jersey Governor Chris Christie in 2010.

24 1910 floor plans for Penn Station can be viewed at <http://pennpathfinder.blogspot.com/p/historic-floorplans.html>.

25 [https://en.wikipedia.org/wiki/Exchange_Place_\(PRR_station\)](https://en.wikipedia.org/wiki/Exchange_Place_(PRR_station))

26 The pamphlet can be viewed at http://pennpathfinder.blogspot.com/p/ephemera_13.html

27 Amtrak, "Timeline of Service Changes at Penn Station," Powerpoint presentation, January 2007, author's files.

28 Railway Gazette, "NJ Triple Opening," <http://www.railwaygazette.com/news/single-view/view/nj-triple-opening.html>

29 *Record of Decision, Access to the Region's Core Project (ARC) in Hudson County, New Jersey and New York City, New York*, Federal Transit Administration, January 14, 2009

In the course of its environmental review process and preliminary engineering, ARC went through a complete redesign on the Manhattan end. The original ARC plan, later characterized as the Draft Environmental Impact Statement (DEIS) Build Alternative, would have constructed two new rail tunnels beneath the Hudson, with connections to the existing Penn Station platforms and also to a new station beneath West 34th Street, directly north of the existing station. This proposed alignment was modified in the final plan, known as the Supplemental Draft Environmental Impact Statement (SDEIS) Build Alternative. According to the Record of Decision, geotechnical analyses at the proposed station location showed poor rock conditions at the planned elevation, necessitating the construction of a deeper station where rock conditions were better³⁰. Additional considerations are described in an article published by Railway Age:

...the new tunnels had to go deeper than originally proposed, because there's all kinds of natural and man-made obstacles in the way...

Among the obstacles are an historic river bulkhead, NYCT's Number 7 Subway Line Extension project (tunnels for which are nearly complete), and city water mains and sewers. A higher approach would have involved additional Hudson River fill, which the Army Corps of Engineers said would not be possible, and tearing down and rebuilding an historic bulkhead and a portion of a Hudson River park. But worse than that, it would have involved trenching—making a huge open cut, temporarily shutting down the West Side Highway, displacing structures in LIRR's West Side Yard, relocating Amtrak's West Side Connection, clearing out a major office building to underpin it, and other disruptions...³¹

Lowering the profile of the new tunnels precluded the originally planned connections to existing Penn Station, a move to which Amtrak strongly objected. In an April 28, 2008 letter to Tom Schultze, NJ Transit's ARC Project Director, Alex Kummant, Amtrak's President and Chief Executive Officer, wrote that "Considering the...projected increase in...passenger trains operating over the entire Northeast Corridor...Amtrak has real concerns that the existing NEC trans-Hudson rail tunnels will prove inadequate to sustain operations in the future."³²

ARC's proposed alignment is shown in Figure 2 below. The 34th Street station, shown in Figure 3 below, would have provided connections to the Sixth, Seventh and Eighth Avenue subways.

ARC was an \$8.7 billion project at the time of its approval in 2009. By the time of its cancellation the following year, there was a disputed level of cost overruns, in the range of \$1-2 billion, with the exact figure left unresolved.³³

Following ARC's cancellation, in 2011 Amtrak proposed the Gateway project, which would provide two new tunnels under the Hudson River and, unlike ARC, support the long-term growth of intercity rail traffic in the Northeast Corridor. The Gateway Program (Figure 4) is a comprehensive plan to make all the improvements necessary to increase trans-Hudson rail capacity.

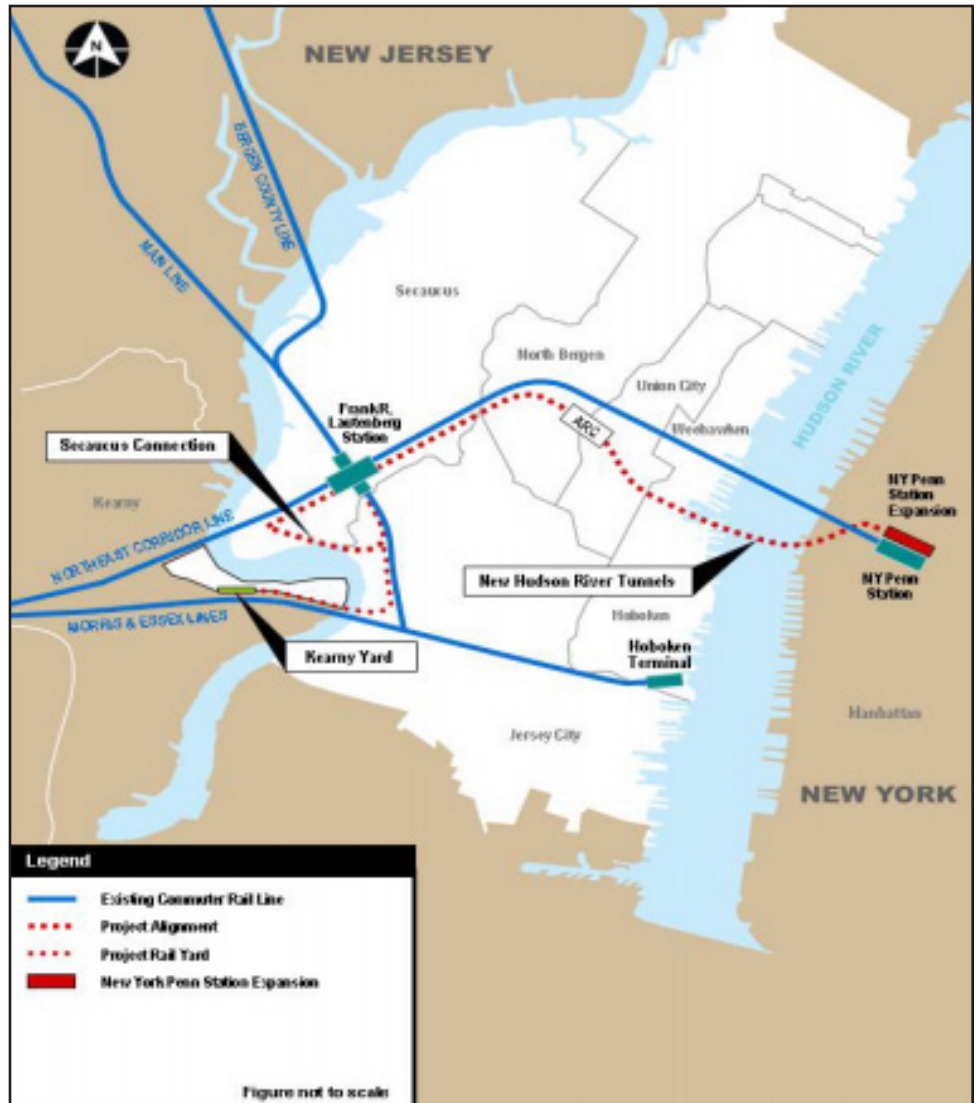
30 Ibid., p. 5

31 William C. Vantuono, "Reconquering Gotham," *Railway Age*, April 30, 2010, <https://web.archive.org/web/20100926142417/http://www.railwayage.com/in-this-issue/reconquering-gotham-april-2010.html>

32 NJ Transit, *Access to the Region's Core: Final Environmental Impact Statement*, October 2008, Appendix 18.0, Amtrak Correspondence, p. 24

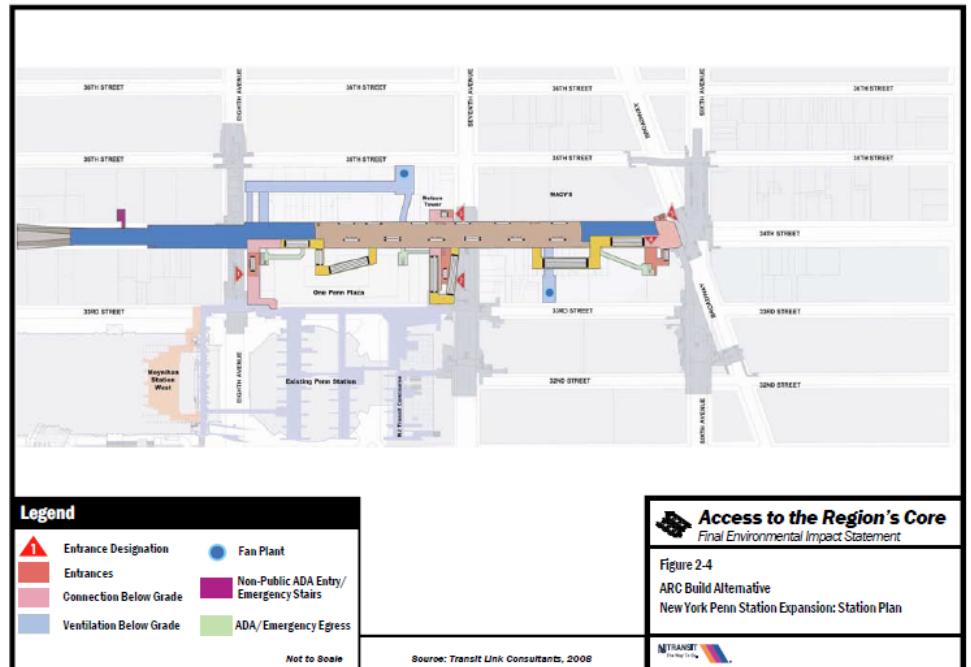
33 Wikipedia, https://ipfs.io/ipfs/QmXoypizjW3WknFijnKLwHCnL72vedxjQkDDPImXWo6uco/wiki/Access_to_the_Region's_Core.html

Figure 2: ARC Alignment



Source: NJ Transit, Preliminary Engineering Project Definition Report, August 21, 2008, p. 1-2

Figure 3: Proposed ARC Manhattan Station



Source: NJ Transit, Access to the Region's Core: Final Environmental Impact Statement, October 2008, p. 2-20

Figure 4: Amtrak's Gateway Program



Source: Amtrak <https://nec.amtrak.com/resource/gateway-program-overview-map/>

These include track expansions and the reconstruction of two bridges in New Jersey, the construction of two new tunnels under the Hudson River, a connection to existing Penn Station and a connection to a new station with expanded platforms. Amtrak originally identified the location of the new station as Block 780, the block immediately south of Penn Station bounded by Seventh and Eighth Avenues and West 30th and 31st Streets, as well as portions of the blocks immediately to the east and west. These blocks are densely developed and would carry a high acquisition cost and considerable relocation. Some of these costs could be offset by future development above the station.³⁴

The Gateway plan resembles the original ARC DEIS Build Alternative in that by approaching Manhattan at a relatively high elevation, it is able to connect to existing Penn Station, whose tracks lie just below the Seventh and Eighth Avenue subway lines, each of which in turn lies just below the street with no room for a pedestrian mezzanine above. To avoid some of the problems ARC had with cut-and-cover construction and impacts on adjacent buildings, Amtrak needed to secure a right-of-way through the Hudson Yards project, which was underway above the Long Island Railroad's West Side Yards. Accordingly, in 2013 Amtrak obtained \$183 million in Federal funding to construct a "tunnel box" under the platform covering the eastern portion of the rail yards, between Tenth and Eleventh Avenues³⁵. This portion represents the initial phase of Hudson Yards construction. Additional funding of \$440 million would be needed to continue the "tunnel box" beneath the western portion of the rail yard, between Eleventh and Twelfth Avenues, where platform construction has not yet begun³⁶.

Hurricane Sandy in October 2012 flooded the existing Hudson River rail tunnels. The resulting salt water infiltration degraded the concrete lining of the tunnels, necessitating the future complete reconstruction of each tunnel. This would require that the tunnels be taken out of service for an extended period of time. To permit service to be maintained while the work is undertaken, Amtrak and NJ Transit proposed the Hudson

34 Wikipedia, https://ipfs.io/ipfs/QmXoypijzW3WknFijnKLwHCnL72vedxjQkDDPI mXWo6uco/wiki/Gateway_Project.html

35 Ibid.

36 Daniel Geiger, "Hudson Yards and Gateway rely on getting small section of tunnel funded," http://www.crainsnewyork.com/article/20170906/REAL_ESTATE/170909952/hudson-yards-and-gateway-hinge-finding-money-for-a-small-section-of-tunnel, September 6, 2017

Tunnel Project, which would construct two new tunnels under the Hudson, bypassing the existing tunnels and connecting to the existing Penn Station platforms. Capacity expansion would be put off until a second phase.

NJ Transit submitted a Draft Environmental Impact Statement (DEIS) for the Hudson Tunnel Project to the Federal Railroad Administration in June 2017.³⁷ The DEIS describes the proposed alignment for the new tunnels. Unlike the ARC DEIS Build Alternative, the Hudson River Tunnel Preferred Alternative would pass beneath the Hudson River bulkhead, and the impacts on the river bed from construction would be diminished. The cost of the Hudson River Tunnel is estimated at \$11.1 billion, with an additional \$1.8 billion cost to rehabilitate the existing tunnels. The DEIS states that the Preferred Alternative does not preclude multiple options for future capacity expansion, including but not limited to the Block 780 plan. However, the DEIS states that a deep-cavern expansion under 34th Street, similar to the ARC SDEIS Build Alternative, and unlike the Block 780 option connecting directly to major subway lines, would require additional Hudson River tunnels to be constructed, branching off from the Northeast Corridor west of the Palisades.³⁸

In November 2015, officials from the Federal Department of Transportation and elected officials from New York and New Jersey announced an agreement in which the Federal government would fund 50 percent of the Hudson River Tunnel project, and the states would split the remaining half of the cost.³⁹ The agreement was non-binding, and in December 2017, it was repudiated by the Trump administration. In a December 29th, 2017 letter to New York State Budget Director Robert Mujica, a Federal Transit Administration official, K. Jane Williams, wrote, “We consider it unhelpful to reference a non-existent ‘agreement’ rather than directly address the responsibility for funding a local project where 9 out of 10 passengers are local transit riders.”⁴⁰ The letter placed the ultimate availability of significant Federal funding for the project in question, a view that was reinforced by the low rating the project received in a Federal Transit Administration report to Congress⁴¹ and the limited new Federal funding proposed in the Trump Administration’s infrastructure plan announced in February 2018⁴².

Somewhat obscured in the discussion of the Hudson Tunnel Project is that, even if funded and built, it provides no relief for New Jersey Transit commuters. A capacity expansion that provides such relief is put off to a second phase, far off in the future. In the meantime, by 2016, according to the Hub-Bound Travel data cited in Table 7 above, New Jersey Transit’s peak rail ridership had already exceeded ARC’s forecast of 61,797 passengers in 2030 under the “no build” scenario -- that is, without the construction of new rail tunnels.⁴³

As of March 2018, decision makers in New York and New Jersey have not determined how they will respond to the Trump administration’s position. They face a set of unpalatable choices. They can wait for the political environment for Federal funding to improve, perhaps after the 2018 or 2020 elections, depending on the nationwide electoral success of the Democratic party, dominant in the Northeast. However, further delay could mean that no replacement tunnels are available within the time window created by the existing tunnels’ remaining useful life. This raises the danger of the nightmare scenario coming to pass -- in which one or both

37 The DEIS can be found at <http://www.hudsonstunnelproject.com/deis.html>

38 Ibid., pp 2-32 and 2-33.

39 Alyana Alfaro, “Booker Lauds Federal Agreement to Pay for Half of New Trans-Hudson-River Tunnel,” <http://observer.com/2015/11/booker-lauds-federal-agreement-to-pay-for-half-of-new-trans-hudson-river-tunnel/>, 11/12/15

40 A copy of the letter can be viewed at <http://www.crainsnewyork.com/assets/pdf/CN1137151229.PDF>

41 Ryan Hutchins and Dana Rubinstein, “Trump administration deals another blow to Gateway Tunnel project,” <https://www.politico.com/states/new-york/albany/story/2018/02/13/trump-administration-deals-another-blow-to-gateway-tunnel-project-251797>, February 13, 2018.

42 Larry Higgs and Jonathan D. Salant, “Trump falling short in paying for Gateway Project, Phil Murphy and others say,” http://www.nj.com/politics/index.ssf/2018/02/gateway_funding_could_hit_bumping_post_under_trump.html, February 12, 2018.

43 ARC FEIS, Table 3.1-8, p. 3.1-12

tunnels must be closed and trans-Hudson transit is dependent for several years on an improvised emergency bus and ferry service.

Alternatively, the states and the City of New York can concede the need to contribute more to the project themselves. It is likely that the debt service cost to each state of assuming half of the previously assumed Federal share would exceed \$100 million a year. This fiscal burden might be difficult to justify given that there is no capacity increase in the first phase.

A key milestone for the future of the Hudson Tunnel project is the construction of an expanded “tunnel box” under the western portion of the Hudson Yards real estate development.⁴⁴ If no funding is made available for this improvement before construction begins on this phase, the Hudson Tunnel Project cannot be completed as planned.

The omnibus spending bill approved by Congress and signed by the President in March 2018 included commitments of a “firm” \$540 million to the Gateway program, according to New York Senator and Senate Minority Leader Charles Schumer.⁴⁵ However, there still may be additional procedural obstacles the Trump administration could use to prevent these funds from being spent on Gateway.⁴⁶ As of the bill’s passage, the availability of these funds for the Western Rail Yard “tunnel box” was unclear.

Port Authority Bus Terminal

The Port Authority Bus Terminal, which often graces lists of the world’s ugliest buildings,⁴⁷ is actually three buildings, the older encased within the newer. The original Port Authority Bus Terminal, on the block bounded by Eighth and Ninth Avenues, West 40th and West 41st Streets, which opened in 1950, had two bus levels, one for intercity buses, and one for commuter buses, and a parking level on the roof. Built in the Art Moderne style, this was the most architecturally coherent of the three iterations of the bus terminal.⁴⁸

In 1963, three new parking levels were added above the original structure, and the former parking level became an additional level for commuter buses. The new parking structure was supported by columns wrapped around the outside of the building.⁴⁹ This construction remains visible today on portions of the side street frontages.

The final expansion of the bus terminal, the North Wing extending the Eighth Avenue side of the bus terminal to West 42nd Street, opened in 1979. At that time, the curved Eighth Avenue facade of the original building was encased in a two-block-long steel truss. The bus terminal exists in this form today.

44 Ryan Hutchins and Dana Rubinstein, “Officials turn to Hudson Yards developer to fund piece of Gateway project,” <https://www.politico.com/states/new-york/albany/story/2017/09/25/officials-turn-to-hudson-yards-developer-to-fund-piece-of-gateway-project-114699>, September 26, 2017.

45 Tom Brune, “Lawmakers, Trump claim victory in Gateway funding fight,” *Newsday*, March 22, 2018, <https://www.newsday.com/news/region-state/gateway-project-funding-1.17615738>.

46 Curtis Tate, “How Trump could block money for Hudson River rail tunnel, imperiling NYC commute,” <https://www.northjersey.com/story/news/transportation/2018/03/22/trump-could-block-hudson-river-rail-tunnel/450182002/>, March 22, 2018.

47 See, e.g. Reuters Staff, “Travel Picks: 10 Top Ugly Buildings and Monument,” <https://www.reuters.com/article/us-travel-picks-ugly/travel-picks-10-top-ugly-buildings-and-monument-idUSTRE4AD2V720081114>, November 14, 2008

48 A photo providing a good view of the original bus terminal can be viewed at [http://collections.mcny.org/Collection/\[Port-Authority-Bus-Terminal.\]-2F3HRGMZWE7T.html](http://collections.mcny.org/Collection/[Port-Authority-Bus-Terminal.]-2F3HRGMZWE7T.html).

49 A photo of the 1963 expansion can be viewed at <https://www.gettyimages.com/detail/news-photo/the-port-authority-bus-terminal-in-new-york-has-three-news-photo/3320626#15th-june-1967-the-port-authority-bus-terminal-in-new-york-has-three-picture-id3320626>.

The cobbled-together nature of the bus terminal, in addition to its aesthetic shortcomings, makes the terminal difficult to operate today. The concrete slabs supporting the bus levels have deteriorated and need to be replaced. The bus gates are not designed for longer modern buses, articulated buses or double-decker buses. There is inadequate midday parking, staging and circulation space for buses. The public areas of the terminal do not meet current safety or accessibility requirements.⁵⁰

Because the bus terminal needs to operate continuously, the Port Authority concluded that it could not feasibly be rehabilitated, and would need to be replaced. The Midtown Bus Master Plan was an internal Port Authority planning exercise to examine potential alternatives for a new bus terminal and select a preferred option. By October 2015, Port Authority staff presented three options to the Board of Commissioners.⁵¹ Concept 1 would construct an interim terminal facility west of Ninth Avenue between West 39th and West 40th Streets. The existing terminal would be demolished and replaced with a new terminal, at which point the interim terminal would become a bus storage and staging facility.

Concept 3 would construct a new terminal and a bus storage and staging facility in one phase on a combination of private and Port Authority property. The new bus terminal would have a pedestrian entrance east of Ninth Avenue, and bridge over both Ninth and Tenth Avenues between West 39th and West 40th Streets. A bus staging and storage facility would be constructed between West 38th and West 39th Streets, from just west of Ninth Avenue to Tenth Avenue. A large number of residences, and a church, would need to be acquired and demolished at the Ninth Avenue end of the project. The site of the existing bus terminal would become available for redevelopment to help defray the cost of the project.

Concept 5 was a reduced version of concept 3, assuming the availability of transit alternatives that would divert some bus demand to other modes. While no specific recommendation was made by Port Authority staff, the public had the clear impression that the agency favored Option 3. This was reinforced for city officials who attended the Midtown Bus Master Plan Peer Review organized by the Port Authority in November 2015. Attendees at that meeting were able to view a three-dimensional model of Option 3.⁵²

The insular nature of the Port Authority's planning process was a major flaw. The Port Authority and its consultants had approached the bus terminal planning problem as if could be solved on purely engineering grounds, with no regard for the urban context around the bus terminal site. In fact, the context was one of large numbers of workers and residents who would be affected by a new bus terminal. In addition to the extensive relocation, Option 3 would construct a 140-foot-tall megastructure from Ninth to Eleventh Avenues, impacting surrounding residential buildings, dividing the neighborhood and undermining the city's Hudson Yards plan by capping the new Hudson Park between Tenth and Eleventh Avenues with a bus terminal at its north end.

Negative feedback was not long in coming. In a November 12, 2015 letter to Pat Foye, the Port Authority's Executive Director, leaders of Manhattan Community Board 4 criticized Option 3's need for property condemnation; its poor connectivity to the subway, suggesting the need for construction of an additional station on the #7 subway at Tenth Avenue; the Port Authority's failure to provide for a Tour and Charter Bus Garage; and Option 3's overall lack of integration into the urban fabric.⁵³

50 Port Authority of New York and New Jersey, "Midtown Bus Master Planning Update," Powerpoint presentation, March 19, 2015, <http://corpinfo.panynj.gov/documents/Update-on-Midtown-Bus-Master-Plan-2/>.

51 Port Authority of New York and New Jersey, "Midtown Bus Master Plan Update," Powerpoint presentation, October 22, 2015, <http://corpinfo.panynj.gov/documents/Board-Meeting-Port-Authority-Bus-Terminal-Replacem/>.

52 The author attended the Peer Review as a New York City official.

53 The letter can be viewed at http://www.nyc.gov/html/mancb4/downloads/pdf/20_trans_letter_to_panynj_re_master_plan.pdf.

The public criticism of the Midtown Bus Master Plan slowed the momentum of the bus terminal replacement. Much of 2016 was devoted to the International Design and Deliverability Competition, which ultimately failed to produce a breakthrough concept meeting the needs of commuters and the concerns of the community. The most interesting detail of the report of the panel of experts retained by the Port Authority to review the competition submissions is to “explore a preliminary staff proposal to rebuild the current terminal on its existing site while it continues to operate (i.e., top-down development)”.⁵⁴

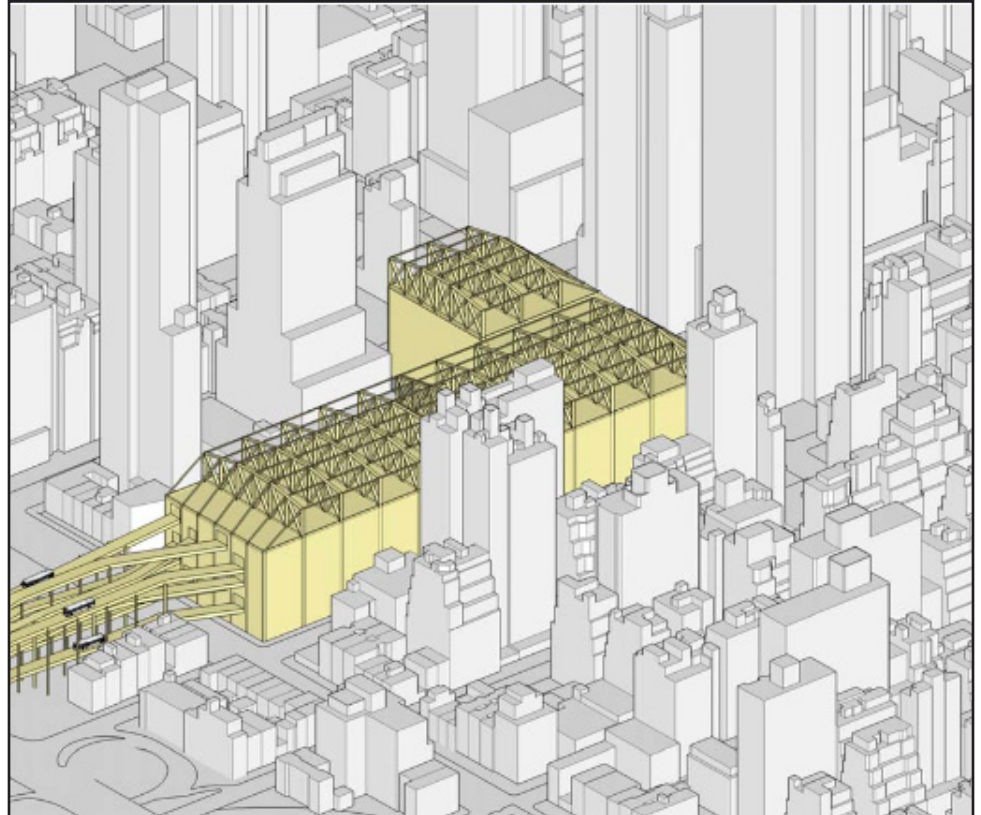
This was the first hint of an emerging concept being developed by Port Authority staff: To rebuild the bus terminal at its current location while keeping it continuously in operation. A presentation to the Port Authority’s Board of Commissioners on the “Build-in-Place” Option in September 2017 deemed it “feasible”.⁵⁵

The build-in-place option (Figure 5) would first demolish the parking decks constructed in 1963, and replace them with two new bus levels, supported, like the parking decks, by columns wrapped around the exterior of the existing building. These new bus decks would support continued operations while the existing bus terminal is demolished from the top down, and replaced with a new facility.

54 Port Authority of New York and New Jersey, *Port Authority Bus Terminal International Design + Deliverability Competition Panel Report*, Powerpoint presentation, <http://corpinfo.panynj.gov/documents/Port-Authority-Bus-Terminal-International-Design-and-Deliverability-Panel-Report/>, October 20, 2016.

55 Port Authority of New York and New Jersey, Board Meeting Transcripts, September 28, 2017, Remarks of Steve Plate, Chief of Major Capital Projects, <http://corpinfo.panynj.gov/documents/Transcript-6182/>.

Figure 5: PABT Build-in-Place Option



Source: Port Authority of New York and New Jersey, <http://corpinfo.panynj.gov/documents/PABT-Rehabilitation-Program-Build-In-Place-Option/>

The build-in-place concept has the potential to address several of Community Board 4's issues. It does not, subject to further refinement, require residential relocation. It places commuters at the same transit-accessible location where they are today, and does not require construction of a new subway station.

There are many issues with the build-in-place concept. Designing this massive structure to be an asset, and not a detriment to its surrounding neighborhood will be a daunting task. The new building will be massive, rising vertically from the street, and the façade will need to be designed to mitigate the effects of this bulk. Pedestrian circulation will be challenging, given the additional height of the new facility. The impact on neighboring properties and the streetscape of the new bus ramps necessary to access the new upper levels will need to be considered. Combining construction of a major new building with the continued operation of the world's busiest commuter bus terminal will be one of the most complex management problems ever solved. Costs and financing also remain to be determined.

The Port Authority's 2018 capital budget includes \$55 million for planning and design activities for a new Port Authority Bus Terminal.⁵⁶ The funding will be used to undertake project planning and an environmental review pursuant to Federal requirements under the National Environmental Policy Act, since the bus terminal is an interstate facility and may receive Federal funding. While the build-in-place option is not formally favored over other alternatives, it appears to have the best chance of becoming the preferred alternative at this point.

The Port Authority's 2017-26 Capital Plan has \$3.5 billion set aside for the new terminal, but this is thought likely to be insufficient. However, with the Port Authority's commitment, and considering the political uncertainties affecting the Hudson Tunnel Project, the new bus terminal is believed to be the trans-Hudson transit improvement most likely to be realized in the next decade.⁵⁷

Extending the Subway to New Jersey

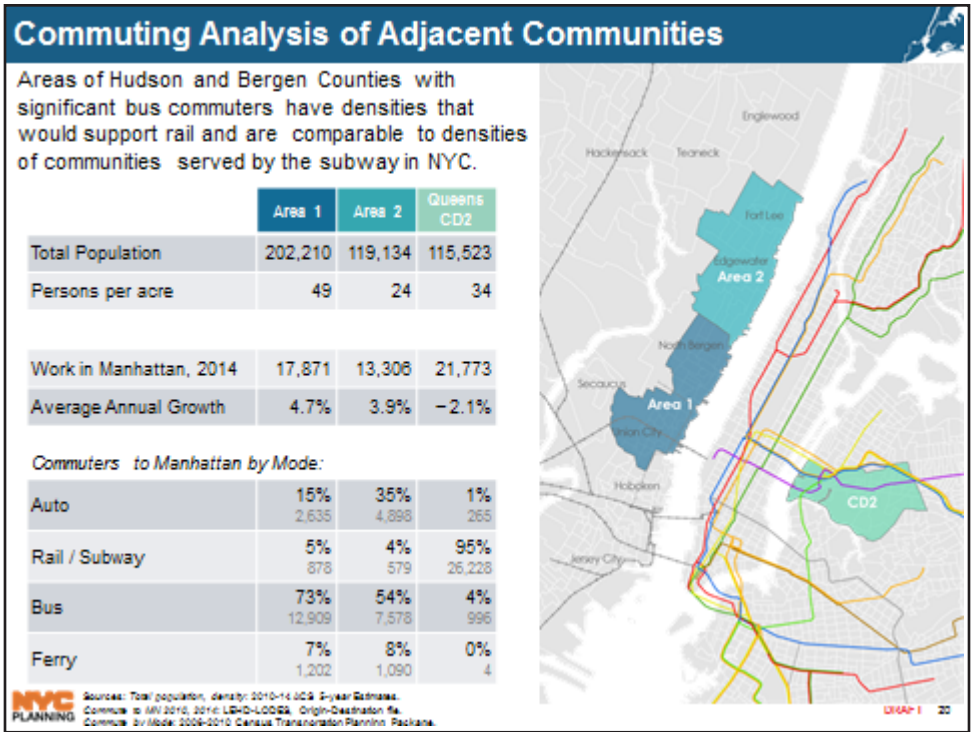
The likely outcome discussed above, in which New Jersey's dependence on bus commuting continues to grow, is the undesirable consequence of a long-term failure to invest in adequate rail transit across the Hudson. A slide (Figure 6) from a December 2017 presentation by the Department of City Planning to Manhattan Community Board 4 is illustrative of the different approaches that have been taken to transporting commuters across rivers to the East and West Sides of Manhattan. On the east side is Queens Community District 2. From CD 2, 95 percent of Manhattan commuters use rail or subway.

On the west side of the Hudson, the department created two "synthetic" community districts, Area 1 and Area 2. Area 1 includes Union City and North Bergen, and is more populous, with a higher population density, than Queens CD 2. Area 2 includes Edgewater and Fort Lee, and is about as populous, but with a lower population density than Queens CD 2. Areas 1 and 2, combined, have more Manhattan commuters than Queens CD 2. In both Area 1 and Area 2, the majority of commuters arrive by bus. A sizable share of commuters drive. Only a small fraction arrives by rail or subway.

56 Port Authority of New York and New Jersey, *Proposed 2018 Budget*, Powerpoint presentation, <http://corpinfo.panynj.gov/documents/2018-Proposed-Budget/>, December 7, 2017.

57 Loretta Weinberg and Bob Gordon, "Keep Port Authority Bus Terminal Expansion on Fast Track," <https://www.northjersey.com/story/opinion/contributors/2017/10/09/opinion-keep-port-authority-bus-terminal-expansion-fast-track/746139001/>, October 9, 2017.

Figure 6: Commuting Analysis of Adjacent Communities



Source: New York City, Department of City Planning, Presentation to Manhattan Community Board 4, December 6, 2017

The Port Authority is planning for an increase in bus arrivals in the 8-9 a.m. peak hour from 615 in the base study year of 2011 to 855 in 2040, a 40 percent increase.⁵⁸ Moreover, post-2040 even an expanded bus terminal may not be adequate if New Jersey continues to add population and commuters. Operating such a massive fleet of commuter buses is expensive for New Jersey, and contributes to air pollution and traffic congestion in the state, but the greatest impacts are experienced in the Manhattan community adjacent to the bus terminal. Since the many of the fastest-growing communities in New Jersey are as close to Manhattan as the New York boroughs of the Bronx, Brooklyn and Queens, and have a relatively high population density, subway service, with high frequency and capacity, could make sense as a fast, efficient and low-polluting means of moving large numbers of people underground.

In recent decades, one substantial study of expanding MTA subway service to New Jersey has been undertaken. This is the study sponsored by the City, undertaken after ARC's cancellation in 2011 but published in 2013, of extending the #7 subway from its present terminus at the south end of the tail tracks serving the 34th Street/Hudson Yards station (West 25th Street and 11th Avenue) to Secaucus Junction in New Jersey.⁵⁹

The plan studied by the city (Figure 7) would have a single station in New Jersey, at the Frank L. Lautenberg Station in Secaucus. Adjacent to the station would be a 60-bay bus terminal to which some buses serving the Port Authority Bus Terminal could be diverted. The Port Authority's Commuting Capacity Study estimates that the plan, if implemented, has the potential to divert an estimated 200 peak-hour buses (of the 855 forecast in 2040) from the Port Authority Bus Terminal to Secaucus. No other transit project studied has the potential to divert so many buses.⁶⁰

58 *Commuting Capacity Study*, p. 1.

59 Parsons Brinckerhoff, *No. 7 Secaucus Extension Feasibility Analysis Final Report*, April 2013, https://www.nycdc.com/sites/default/files/filemanager/Resources/Studies/No_7_Secaucus_Extension_Final_Report_April_2013.pdf.

60 *Commuting Capacity Study*, p. 23.

Figure 7: Proposed No. 7 Secaucus Extension Conceptual Alignment



Source: Parsons Brinckerhoff, No. 7 Secaucus Extension Feasibility Analysis Final Report

The plan studied by the city raises a number of issues. First, it would serve only bus markets south and west of Secaucus, and not the rapidly growing market north of Hoboken along the Palisades (Areas 1 and 2 as characterized by the Department of City Planning in Figure 6 above). In that area, it would not make sense for commuters to take a bus west to Secaucus to connect with a subway to go east to Manhattan. The plan could be amended to include an additional station close to the west shore of the Hudson, picking up additional transferring bus passengers, but this may overtax the capacity of a single New York City Transit A Division (the former IRT) subway line. The city’s study estimates the number of AM peak hour passengers from Secaucus at 19,710.⁶¹ The AM peak from New Jersey becomes the outbound off-peak service in New York City (all trains run local in Queens). The Hudson Yards Final Generic EIS calculated peak-hour capacity for this service at 29,040.⁶² While the 34th Street/Hudson Yards station was forecast to be lightly used for AM peak outbound trips, many inbound New Jersey commuters would stay on the train to, or past, Times Square, where the 7 train outbound service is more heavily utilized. Thus the question of how much capacity exists to take on additional passengers from New Jersey would need to be carefully studied.

Beyond the issue of the adequacy of this transit solution, the 7 train Secaucus extension plan raises a number of additional issues. First is cost. The city’s study did not estimate costs, leaving that task for a later phase of the study that never occurred.⁶³ The extension of the subway does have the advantage, relative to Gateway or ARC, that it would use existing stations in Manhattan, and not require the construction of a new station, leading to cost efficiencies. On the other hand, heavy two-way peak service on the 7 line, which heretofore has experienced peak loads in only one direction, would require upgrades of passageways, stairs and escalators at existing stations in Manhattan (Times Square, 5th Avenue/Bryant Park and Grand Central) to handle anticipated passenger flows.⁶⁴

61 No. 7 Secaucus Extension Feasibility Analysis Final Report, p. 46

62 New York City Planning Commission and Metropolitan Transportation Authority, Hudson Yards FGEIS, November 2004, Appendix S.4.2-3 http://www1.nyc.gov/assets/planning/download/pdf/plans/hudson-yards/app_s.4_transit_analysis_fgeis_final.pdf.

63 No. 7 Secaucus Extension Feasibility Analysis Final Report, p.47

64 Ibid., p. 13.

The city's report identified several additional issues with extending the subway to New Jersey. The most significant are legal. Interstate railroads are generally subject to the requirements of the Federal Railroad Safety Act. (There is an exemption for urban rapid transit systems, but the extent of applicability is not clear-cut). New York City Transit, as a purely New York State entity, is without question not subject to these provisions. Should it begin to operate in New Jersey, its exempt status under the Act might be subject to legal challenge, and at the time the issue was studied in 2011 the MTA believed that clarifying legislation would be needed from Congress.⁶⁵

In addition, safety regulations applicable to rail transit may differ between New York and New Jersey. Clarifying legislation may be necessary from New Jersey to permit the subway to operate under a consistent set of regulations.⁶⁶

Third, operating across state lines may bring the subways under the jurisdiction of the Railway Labor Act, which unlike applicable New York State law, permits labor strikes. Again, there is an exception in the Act for interurban electric railways, not connected to the national rail network, but the study team believed clarifying Federal and New Jersey legislation would be necessary to ensure the applicability of New York State labor provisions.⁶⁷

Because of the legal issues, and the potential difficulty of getting the necessary legislation, extending the New York City subway into New Jersey may not prove feasible even if funding were to be possible. Other subway options include expanding the PATH system, which is already subject to Federal jurisdiction because of its past history of shared operations with the Pennsylvania Railroad. Possibly for that reason among others, PATH incurs large operating losses (\$327 million in calendar year 2016).⁶⁸ Yet another option might be to create an entirely separate new operating entity. Any new trans-Hudson subway line operationally separated from New York City Transit would need to construct one or more stations in Manhattan, increasing costs.

If extending the New York City subway does prove operationally feasible, the 7 train may not be the optimal line to extend due to its limited capacity. There are two B Division (IND/BMT) east-west lines in Manhattan, with larger cars and more capacity – the L train under 14th Street and the E train under 53rd Street. Neither has ever been studied as a potential link to New Jersey.

In February 2018 the Port Authority issued a Request for Proposals “for a Consultant to provide expert professional planning services and evaluation of long-term opportunities for additional trans-Hudson rapid transit capacity.”⁶⁹ According to the RFP:

This study is intended to augment the region's current and programmed long-term planning program by examining multiple potential options including possible extensions of the existing transit networks of NJ Transit, the Authority, and the MTA, as well as independent lines, and will remain neutral with regards to the presumed ownership for future capital implementation or operation of projects. It will provide an initial evaluation of multiple potential options that should be considered for future advancement and funding as part of the region's long term strategies for transit capacity expansion. By evaluating the

65 Parsons Brinckerhoff, *No. 7 Secaucus Extension Feasibility Analysis Draft Appendix*, August 2011, Appendix B, Legal Issues Working Group Report, p. 11 (Author's files)

66 Ibid.

67 Ibid., p. 12.

68 Port Authority of New York and New Jersey, *Financial Statements & Appended Notes for the Year Ended December 31, 2016*, <http://corpinfo.panynj.gov/documents/2016-5637/>.

69 http://www.panynj.gov/business-opportunities/pdf/RFPDOC_52219.pdf

feasibility of multiple potential options, the transportation and planning agencies of the region will gain a clearer picture of the relative value of various future capacity solutions to address long term growth in trans-Hudson transit demand, as well as the challenges to their implementation.⁷⁰

Upgrading the PATH

In 2008 the Port Authority announced a \$3.3 billion, ten-year investment program to overhaul the PATH system. The upgrade includes purchase of new rail cars; implementation of communications-based train control; and installation of ten-car platforms at the Harrison and Grove Street PATH stations, enabling all stations on the Newark-to-World Trade Center route to accommodate ten-car trains.⁷¹ These improvements will facilitate the large increase in ridership on this line that was forecast in the Midtown Bus Master Plan. Such an increase is consistent with housing and population growth, particularly in Jersey City. The Port Authority's Commuting Capacity Study finds that these improvements have "the potential to result in a slight reduction of peak-hour demand at the PABT by encouraging use of PATH, and [avoid] creating new growth pressures at the PABT."⁷²

Ferries

Unlike other modes, New Jersey ferries did not grow in passenger volumes between 2008 and 2016, carrying about 12,000 passengers in the AM peak in both periods.⁷³ While costly, ferries are the easiest mode to expand, since the Hudson River has far more capacity for ferries than is used. However, unless subsidized, ferries will be too expensive to divert large number of passengers. New Jersey's topography further complicates matters since there is a grade change created by the Palisades, requiring many potential west-of-Hudson ferry riders to access the Port Imperial ferry terminal opposite Midtown by bus. Passengers generally would rather stay on the bus directly into Manhattan. The Port Authority's Commuting Capacity Study concludes that enhanced bus service to Port Imperial and additional ferry services would have a small effect on Manhattan bus commuting ridership.⁷⁴

During the summer 2017 repairs to track infrastructure at New York Penn Station, in which NJ Transit Morris and Essex Line trains were diverted to Hoboken, a new ferry service was instituted from Hoboken Terminal to West 39th St. in Manhattan. This service was continued during rush hours in the fall of 2017⁷⁵. These ferries, like those from Port Imperial, connect to New York Waterways' bus shuttle to Midtown, and commuters can also walk several blocks to the 34th St. /Hudson Yards subway station at 11th Avenue.

70 Ibid., Attachment A, p. 2.

71 Port Authority of New York and New Jersey, "New Cars are Part of Port Authority's Planned \$3.3 Billion, 10-Year Investment to Overhaul the PATH System" https://www.panynj.gov/press-room/press-item.cfm?headLine_id=950, January 22, 2008.

72 *Commuting Capacity Study*, p. 22.

73 Hub Bound Travel, 2008 and 2016, p. III-36

74 *Commuting Capacity Study*, p. 23.

75 Larry Higgs, "What went right and wrong for commuters during the 'Summer of Hell?'," http://www.nj.com/traffic/index.ssf/2017/09/what_went_right_and_wrong_during_penn_station_summ.html, September 3, 2017.

In January 2018, with funding for the Hudson Tunnel Project in doubt, New Jersey State Senate Transportation Committee Chairman Robert Gordon suggested a “Plan B” including the reconstructed Port Authority Bus Terminal, the expanded PATH line from Newark to the World Trade Center, and expanded ferry service “handling an additional 10,000 daily commuters”⁷⁶. While Gordon did not specify the improvements he has in mind, these might include a larger-capacity ferry landing in Hoboken and constructing a new ferry landing in Manhattan south of the Pier 76 city tow pound, closer to West 34th Street.

76 John Reitmeyer, “Working on Plan B if Feds Leave NY-NJ in Lurch over Trans-Hudson Funding,” <http://www.njspotlight.com/stories/18/01/11/plan-b-if-trump-administration-leaves-region-in-lurch-over-trans-hudson-funding/>, January 12, 2018.

Conclusion

The imbalance of population and employment growth in northern New Jersey, and the consequent need for more and more New Jersey residents to seek employment in New York City, combined with aging infrastructure and lack of state financial support for New Jersey Transit, has created a crisis in trans-Hudson transportation. This obviously is most directly an issue for New Jersey, whose new governor has called NJ Transit a “national disgrace”.⁷⁷ New Jersey commuters experience overcrowding, breakdowns and delays on a daily basis.

However, New Jersey’s commuter agony is also a problem for New York City and New York State. New York City is the economic engine of the state, and Manhattan accounts for most of the nationally and globally significant businesses that bring income into the city, and support the local services that dominate the economies of the other boroughs. Manhattan, in turn, is increasingly dependent on New Jersey commuters to fill its jobs, particularly at the higher-paying end.

New York City has a chronic housing shortage, and a highly regulated housing market which underperforms in terms of producing new housing, considering the city’s population size and incomes and its levels of employment growth. New Jersey communities have helped alleviate the city’s housing shortage by being far more permissive to new housing developers than is generally the case for suburban municipalities in New York State. In addition to providing housing, New Jersey relieves New York City and State of the need to provide services to commuters and their families, while the city and state still reap substantial tax revenues from the same individuals.

In the previous decade, New York state and city were happy to facilitate New Jersey’s plan to build ARC, enhancing the New York economy at little cost to them. Governor Christie later cited the unfairness of this arrangement as one reason he cancelled ARC, but he never presented any alternate plan, and let unbalanced growth proceed, bequeathing his successor the transit crisis he faces today.

So where do we go from here? One possibility, looking out to 2040, is that only the new Port Authority bus terminal proceeds, since the Port Authority is committed to funding this project and the current terminal is obsolete and near the end of its useful life. However, no new rail infrastructure is built across the Hudson. Buses may become electrified and autonomous, addressing pollution issues and facilitating dispatching, but passengers will still need to queue, load and unload, and as the number of commuters grows, the new bus terminal and staging facilities may reach their design capacity sooner than anticipated with no planned relief. Bus queuing and perhaps loading and unloading will spill back into the surrounding neighborhood.

At some point in the next two decades, the two Hudson River rail tunnels will need to be shut down for rehabilitation. Without new tunnels, and a peak capacity of as few as six trains an hour through one operating tunnel, an emergency ferry and bus system will need to be established to transport rail commuters between the two states during the construction period. This will probably be accompanied by limitations on private vehicles in the Holland and Lincoln Tunnels and commandeering of curbside parking and loading areas in

⁷⁷ Larry Higgs, “NJ Transit is a ‘national disgrace’ that must be torn down and rebuilt: Murphy,” http://www.nj.com/traffic/index.ssf/2017/12/nj_transit_is_a_national_disgrace_that_must_be_torn_down_and_rebuilt_murphy.html, December 20, 2017.

Manhattan for bus loading. It will be disruptive to workers, businesses and West Side residents and costly to the regional economy.

What are the alternatives to this scenario? There could be a massive Federal infrastructure program providing relief for hard-pressed states and municipalities including implementation of the Gateway program. It's unlikely such a program will be enacted in the Trump administration, but the political climate might change after 2020. However, elected officials need to be realistic about how much money could materialize. New York and New Jersey are much wealthier than most states, ranking third and fourth in per capita personal income.⁷⁸ The states have high construction costs for transportation projects.⁷⁹ And, the national need is great. In Amtrak's Northeast Corridor alone tens of billions of dollars in additional capital investment are required to achieve reliable service, even without major expansions of the network.⁸⁰ Federal relief that comes without a local match for a majority of the cost seems unlikely. There needs to be a more realistic plan for the region than waiting for Federal largesse.

An important component of a more realistic plan would be a concerted effort to create high-end office jobs in transit-accessible locations in New Jersey. This would not solve the problems of the existing Hudson River rail tunnels, but could slow the increase in peak-period bus traffic at the reconstructed Port Authority Bus Terminal and, once a new terminal is completed, permit some transit mode flexibility in the event of an emergency shutdown prior to the completion of new tunnels. To be successful at attracting growing office-based businesses in finance, information and professional and business services, new office development needs to be accessible both to the growing areas of the inner New Jersey suburban counties and to reverse commuters from New York City, without requiring these commuters to drive on already-congested highways.

The upgraded PATH line between the World Trade Center and Newark would seem to have the potential to be the nexus of such an effort. In the inbound AM peak direction, inducing more commuters from Newark and Harrison to exit trains before Manhattan creates capacity for more residents of waterfront areas, where housing is growing, to commute to Manhattan. In the off-peak direction, there is underutilized capacity. Agreement between the MTA and the Port Authority on a shared monthly commuter fare card would facilitate reverse commutation and make Jersey City and Newark more competitive as office locations. Currently, MTA Metrocards can be used only for single-trip PATH fares.

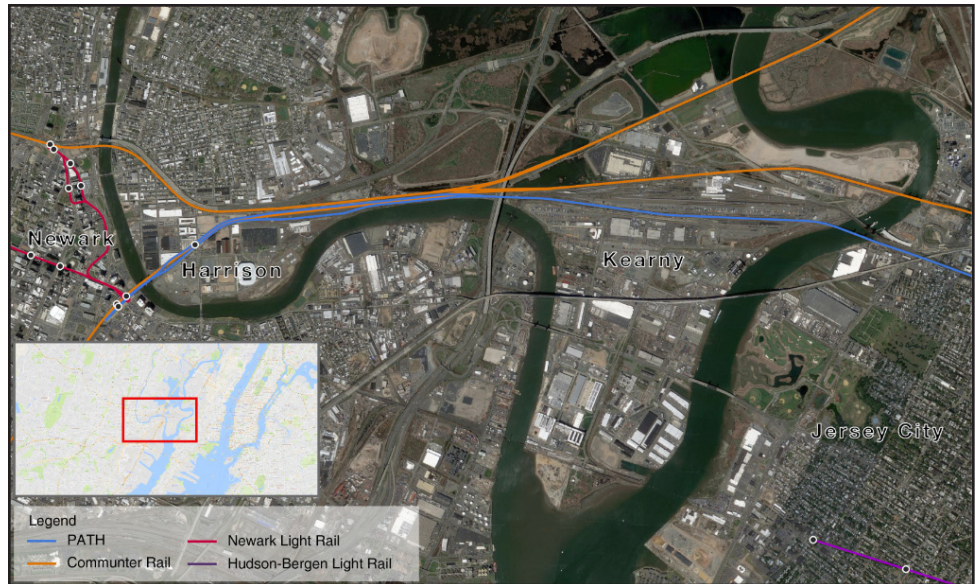
Jersey City has been far more successful in recent years in attracting residential, not office development. The swath of commercial and industrial land running from Jersey City through Kearny and Harrison to Newark, generally bordering the Hackensack and Passaic Rivers, would seem to have long-term potential as a commercial growth area, with a concerted planning effort (Figure 8). One advantage of this area is that the PATH runs through it, although it stops only in Harrison between Journal Square and Newark Penn Station. A redevelopment plan for this area requires coordinated land use changes among several municipalities to allow high-density commercial development. Funding sources would also need to be identified for capital improvements to spur development, including waterfront public space and additional PATH stations, possibly west of Journal Square in Jersey City and in Kearny. However, from the perspective of the state of New Jersey, the cost of facilitating in-state development in this area should be a sound investment, and would be good for the region in any event. New York City, for its part, has a strong economic base and can afford to share the benefits of its growth with the rest of the region.

78 US Department of Commerce, Bureau of Economic Analysis, *State Personal Income 2016*, <https://www.bea.gov/newsreleases/regional/spi/2017/pdf/spi0317.pdf>, p. 7

79 David W. Dunlap, "How Cost of Train Station at World Trade Center Swelled to \$4 Billion," <https://www.nytimes.com/2014/12/03/nyregion/the-4-billion-train-station-at-the-world-trade-center.html>, December 2, 2014.

80 NEC Future Tier I Draft EIS, Appendices B.05: Tier I EIS Alternatives Report and B.06: Capital Costs Technical Memorandum, https://www.fra.dot.gov/necfuture/tier1_eis/deis/

Figure 8: Commercial and Industrial Area Between Jersey City and Newark, NJ



Source: Ari Kaputkin, Rudin Center

Building on New Jersey State Senator Gordon’s suggestions, improving the capacity of ferry landings at Hoboken, Port Imperial and the West Side of Manhattan can better prepare the region for an emergency shutdown of one of the existing Hudson River rail tunnels. However, the cost of operating ferries and the time and inconvenience of the three-mode trip into Manhattan for most New Jersey commuters means that enhanced ferries are unlikely to mitigate significantly the need for more rail capacity.

High-capacity aerial ropeways represent another possible short-term solution. In recent decades, gondola systems have been constructed around the world as urban mass transit. Aerial ropeways can be constructed relatively quickly and, with a capacity of 3,000-4,000 passengers per hour⁸¹, are comparable to ferries but have the ability to move passengers inland in one trip.

Unavoidably, however, continued commuter growth from New Jersey should induce the states of New York and New Jersey and the City of New York to agree collectively to make the transit investments needed to preserve and enhance New York City’s economic primacy, on which they all depend. Given the limited time window to construct new rail tunnels prior to the unavoidable shutdown of the existing tunnels for reconstruction, waiting for the Federal funding picture to improve is risky. If a tunnel shutdown impairs the New York City job-creating mechanism, it may be difficult to restart. The region can’t function without its transit network. If that network breaks down, the regional labor market fragments and the benefits to businesses of locating in the nation’s largest and most talent-rich labor market is lost. Stripped of this appeal for nationally and globally significant businesses, the region’s high costs become less tolerable and growth is likely to slow as businesses choose to expand in less-expensive metropolitan areas. New York City and State would then be exposed to the same economic stagnation and budget-balancing difficulties New Jersey has experienced, and New Jersey’s challenges would become worse. Avoiding this outcome should be a focus of elected officials in both states.

The states and the City need to give careful consideration to building new Hudson River rail tunnels without a Federal funding commitment. The City needs to be involved to protect its interests. Outsourcing the economic future of the City of New York to the states of New York and New Jersey is risky since the states do not necessarily perceive an incentive to act in the City’s best interests. Having a place at the table probably

81 Fanny Carlet, “An Overview of Aerial Ropeway Transit and its Potential on Urban Environments,” in http://sbel6torino.org/downloads/SBEI6TO_proceedings.pdf, pp. 288-295.

means participating in the financing. The Port Authority will also be interested in zoning changes that enhance the value of its properties in the Hudson Yards area, to supplement bond financing with revenues from real estate development. Further study is needed to determine whether this already-dense area can support additional development resulting, for example, from the redistribution of Port Authority development rights from transportation infrastructure to potential landing sites nearby.

The states and the City should review existing budgetary commitments as well as the potential for new revenue sources. They will need to evaluate their other capital priorities in light of transit needs. Transit wish lists should be pared down to critical needs.

Financing the sums of money involved locally, while at the same time using the Port Authority's bonding power to construct a new bus terminal, and resolving the sizable capital needs of the New York City subways, is daunting. One possible move would be new taxes to recapture some or all of the benefits to real estate pass-through entities contained in the tax legislation passed by Congress at the end of 2017.⁸² Judging from the strength of the New York area real estate markets, there does not appear to have been a need for additional incentives to induce real estate investment. U.S. Senate Democrats have proposed a "Jobs & Infrastructure Plan for America's Workers" that would roll back tax cuts to fund infrastructure investments at the national level⁸³. While this plan is unlikely to proceed while Republicans hold power, tax cuts can also be recaptured at the state level, particularly for immobile industries like real estate.

The states and the City also need to consider measures to contain costs and avoid cost overruns. The New York area has inherently high construction costs due to its density, congestion and high land costs, but work rules, bidding procedures and construction supervision are endemic problems and need to be addressed.⁸⁴

An additional advantage, for the city and the two states, of moving ahead of a federal funding commitment is that they would have more leverage to craft a transportation solution that best serves the metropolitan region, such as creating a rail tunnel that prioritizes commuters over intercity transit. The ARC plan cancelled in 2010, which all had once supported, may represent such a solution. It is unclear whether ARC would be more cost-effective as a mechanism for achieving the rehabilitation of the existing Hudson River rail tunnels, but it would certainly be more cost-effective as a mechanism for commuter relief, since it would provide a capacity expansion for NJ Transit in the first phase. Unlike Amtrak's plan for Block 780, the new platforms would have immediate access to major subway lines, and not require commuters heading to the subway to get to the East Side or Downtown to cross through congested existing Penn Station, or the equally crowded sidewalks above. Reviving ARC would avoid the cost and the political controversy of the massive relocation contemplated to build an expanded Penn Station on Block 780 south of the existing station. A new deep cavern station under 34th Street could also potentially lead to an eastward extension to the East Side or Queens in a later phase. If a new version of ARC were constructed, there would then be sufficient tunnel and platform capacity for the existing Hudson River tunnels to be shut down one at a time. During construction, Amtrak's intercity services could continue to use the limited capacity of existing Penn Station while NJ Transit would mainly use the new platforms. However, although ARC was fully planned in 2009, the passage of time would likely necessitate reconsideration of the original plan. ARC's alignment passed under the eastern portion of the West Side Yard⁸⁵, which now has been redeveloped with a platform and high-rise buildings. Redesign and an amended Federal record of decision would cause additional delays.

82 John Engle, "The Biggest Winner of the Tax Bill: Commercial Real Estate," <https://seekingalpha.com/article/4132973-big-winner-tax-bill-commercial-real-estate>, December 20th, 2017

83 <https://www.democrats.senate.gov/imo/media/doc/Senate%20Democrats'%20Jobs%20and%20Infrastructure%20Plan%20One%20Pager.pdf>

84 Alon Levy, "Why It's So Expensive to Build Urban Rail in the U.S", <https://www.citylab.com/transportation/2018/01/why-its-so-expensive-to-build-urban-rail-in-the-us/551408/>, January 26th, 2017

85 ARC FEIS, Figure 2-7, p. 2-25

What if the political cycle does turn in 2020 and significant Federal infrastructure funding becomes available for New York and New Jersey? The states would then be in a good position to seek reimbursement. There is precedent: In 1992, Senator Daniel Patrick Moynihan persuaded Congress to reimburse New York State for the construction of the Thruway, prior to the creation of the Interstate Highway System. The first priority, however, should be to get a project moving in the limited time window before the existing rail tunnels must be taken out of service.

In the long run, New Jersey commuter growth may well outstrip the capacity of both a new bus terminal and new rail tunnels. A planning process has been initiated by the Port Authority to consider what the further trans-Hudson rail transit priorities of the region will be. It's unlikely the bus terminal will be expanded again. Given the difficulty of finding another bus terminal site in Manhattan and mitigating the impact on development on Manhattan's west side in the coming years, planning for improved commuter transportation across the Hudson River warrants immediate attention.