Multi-Scale Regional Transportation Governance:

Evaluating Cooperation and Decision-making at New York Penn Station

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Submitted to the Department of Urban Studies and Planning and the Department of Civil and Environmental Engineering in partial fulfilment of the requirements for the degrees of:

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Abstract

This thesis examines the existing regional transportation governance structure in New York City, and use Penn Station and the Gateway Rail Tunnel Project as lenses to explore the effectiveness of governance and the ability to realize regional transportation and economic development goals. It will explore multi-scale governance, and the relationships within and between urban, metropolitan and mega-regional transportation governance structures.

New York Pennsylvania Station is a major hub station in New York City and the busiest transportation facility in the United States. As a node that connects two major commuter rail systems (Long Island Rail Road and New Jersey Transit) urban public transit (New York City Transit), and intercity rail (Amtrak), Penn Station is a physical manifestation of competition for space and financial resources, and the necessity of intermodal collaboration and integrated governance to achieve the maximum benefit for the region.

The challenges facing American cities are no longer localized in nature, but rather incorporate not only the central city and its surrounding suburbs, but also the next metropolitan area, or even one hundreds of miles away. Regional governance systems currently in place are ill equipped to deal with challenges that transcend local urban boundaries. These challenges incorporate not only transportation operators, but also government officials, private companies and civil sector organizations. Through interviews with twenty-five senior officials from public, private, academic and civil sector organizations, we explored current regional governance structures and the reality of decision-making, as well as the potential for change in the region.

Through our study of Penn Station, we consider the history that has led to the current structure of the governance system and explore long-, medium- and short-term changes that can help improve regional rail integration and decision-making. Long-term, we discuss the potential for a new regional transportation governance structure incorporating existing operators; in the medium-term, we explore the potential of a station management organization and in the short-term, we discuss several ideas for bridging divides across operators and improving the current travel experience.

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LIST OF ABBREVIATIONS AND ACRONYMS

EPA	-	Environmental Protection Agency
GDC	-	Gateway Development Corporation
LIRR	-	Long Island Rail Road
MTA	-	Metropolitan Transportation Authority
MTACC	-	MTA Capital Construction
MNR	-	Metro North Railroad
MSG	-	Madison Square Garden
NECC	-	Northeast Corridor Commission
NJT	-	New Jersey Transit
NJTPA	-	North Jersey Transportation Planning Authority
NJ Transit	-	New Jersey Transit
NYCDCP	-	New York City Department of City Planning
NYCDOT	-	New York City Department of Transportation
NYCT	-	New York City Transit
NYMTC	-	New York Metropolitan Transportation Council
PANYNJ	-	Port Authority of New York and New Jersey
USDOT	-	United States Department of Transportation

NOTE

Discussion and work on the future of Penn Station and the Gateway Tunnels has been taking place at a rapid pace since the fall of 2015. Since the states of New York and New Jersey together with the federal government announced funding for the Gateway Tunnels, there have been significant developments and updates on a regular basis. When this research began in fall 2013, discussions of Penn Station and the Gateway Tunnels were outside of the public sphere and change did not seem imminent. As this thesis was written, new developments took place at a rapid pace, constantly shifting the landscape. The author strived to keep up with new changes in the governance decision-making landscape, focused on information available between February and May 2016.

1 INTRODUCTION TO HIGH-SPEED RAIL AND REGIONAL TRANSPORTATION

> *"With one or two exceptions, no government structure or means of governance is in place to allow for democratic decision making across the real community, and there is no constituency for these emerging regional communities. The problem is that there are regional problems and local governments" (Royer, 1992)*

The former mayor of Seattle wrote these words in the early 1990s and they still ring true today. The challenges facing American cities are no longer localized in nature, but rather bring together not only the central city and its surrounding suburbs, but also incorporate the next metropolitan area, or even one hundreds of miles away. The regional nature of urban and governmental challenges has not yet been solved, and regional governance systems currently in place are ill equipped to deal with challenges that transcend local urban boundaries.

As life and business transcend urban borders, environmental concerns come to the fore, and young adults call for new means of travel, our transportation systems must rise to meet the challenge. Our highway systems, developed on a federal level with state level funding, transcend urban boundaries, but few other modes have the support from groups or governments with the agency to enact changes.

Existing transportation governance structures, siloed within states, modes and institutions, are ill suited to govern across borders and address issues across multiple scales of transportation service delivery. Additionally, socioeconomic effects of regional plans and projects are impacted by high travel costs and lack of fare integration, issues related to, and key for, regional governance and cooperation. New governance structures or methods of cooperation are needed not only to ensure the feasibility of operations and integration with existing transportation networks, but also to ensure that systems can adapt to changing demand and travel patterns, and continue to provide social and economic benefits across socioeconomic and spatial divides.

In the United States, high-speed rail is often discussed in the media and by politicians as unnecessary spending. However, building out HSR, particularly in the Northeast Corridor, may help spur continued economic growth, relieve congestion in major cities, and provide people with a wider variety of choice in employment location. In order to be effective and

fulfill these goals, HSR must interact with existing transportation systems and governance structures in the region in order to build out an effective network and support economic growth. Industry and political leaders must navigate complex relationships in order to build coalitions and cooperation at the metropolitan and mega-regional scales.
New York's Pennsylvania Station is the physical space where these complex relationships between institutions play out in the Northeast Corridor; located at the heart of the Corridor and the New York Metropolitan Region, decisions made by players with a stake in the station have broad repercussions across the region. Related, the Gateway Rail Tunnel Project, a current project to add two new rail tunnels under the Hudson River leading to an addition to Penn Station in order to augment the existing two-track tunnel leading from New Jersey to New York, requires cooperation between transit operators and federal, state and local governments.

A vital factor in increasing capacity at Penn Station, these tunnels are not only necessary to continue existing levels of service across the Hudson, but also if high-speed rail and more frequent intercity rail services are to come to the Northeast corridor. Studies for new rail tunnels under the Hudson were initiated in the 1990s, and have gone through several unsuccessful iterations particularly due to uncertainty of funding and a lack of any willing stakeholder to take the lead on the project. A November 2015 decision by the federal government means funding guarantees for the project, but the effectiveness of governance of the project moving forward is uncertain. This project impacts not only the local and regional scales, but also impacts the feasibility of high-speed rail and other forms of intercity rail moving forward. It is indicative of the challenges facing regional transportation governance in New York. A mismatch exists between the scale of transportation governance, and the scale of service provision. While individuals travel throughout a region, individual operators govern service in discrete zones.

This thesis will examine the existing regional transportation governance model in New York City, and use Penn Station and the Gateway Rail Tunnel Project as lenses to explore the effectiveness of governance and the ability to realize regional transportation and economic development goals. It will explore multi-scale governance, and the relationships within and between urban, regional and mega-regional transportation governance structures.

The goal of this research is to identify the gaps in current metropolitan governance structures that impact the ability to address modern developments and challenges facing transportation agencies and stakeholders in the New York metropolitan area and the Northeast Corridor. It will examine the role of intercity rail in these structures, and will also begin to articulate methods or structures that can address these gaps in order to better integrate rail transportation planning across multiple scales: station (Penn Station), urban

(New York City), metropolitan (New York Metro Area) and mega-regional (Northeast Corridor). Before coming to any conclusions, it is necessary to understand what changes and developments are currently underway that create the need for an improved system of governance, what the regional goals are for development and equity, and how metropolitan transportation governance has succeeded or failed elsewhere in the world.

Research questions: What is the relationship between multi-scale governance and regional public transportation effectiveness and impact in the New York metropolitan region and Northeast Corridor? How would high-speed rail fit into existing governance structures of transportation in the Northeast Corridor?
Important sub-questions to address throughout this research include:

- What institutional conditions have enabled (or not) successful cooperation of transportation planning in the New York metropolitan region?
- Have these institutions evolved over time to address the needs of the region and if so, how?

1.1 Motivation

The overarching goal of this thesis is to offer recommendations on how regional and mega-regional rail that pass through the New York metropolitan area might be governed more effectively and to develop an understanding of current relationships in the field. This work is motivated by the potential coming of high-speed rail to the Northeast corridor, and the capacity constraints at Penn Station in New York City. As demand increases for both commuter and intercity rail, focusing on governance and organization in addition to physical space is key.

1.2 The Importance of Regional Cooperation in Transportation Provision

Transportation, in particular public transportation, provides access to economic and social opportunities for users and "its physical impacts are not easily constrained by administrative boundaries or agency divisions"(Cenizal, 2015). However, the organizations and mechanisms that control transportation provision are ill able to adapt to the changing nature of cities, travel patterns and technology. In the United States, government is divided between federal, state and local scales, with little provision for regional governance. Issues beyond city limits require cooperation between parties with limited resources and disparate interests. There exists little incentive for these parties to cooperate on issues not directly related to their constituency, particular longer term challenges.

Rarely is there a match between the current administrative boundaries of an urban area, and the social and economic sphere of that same city. The impacts and needs of central cities spill into adjacent municipalities as well as suburbs and bedroom communities where many workers live. Many users travel through a metropolitan area, beyond the limits of a local transportation authority. Over time the perception of distance changes with faster modes of transport, leading to a need to change the view of what the right level is to manage integrated decision-making (Veeneman et al., 2015). Network issues are prominent at the places where these different levels meet, particularly at key hubs, such as Penn Station(Van Nes, 2002).

Public transportation can be a strong regional policy tool that can cut across sectors. It can relate to public values including improving the environment, supporting economic development, fighting global warming, reducing congestion and improving social equity. The key institutions involved in the creation and distribution of public transportation often differ in these key areas because of the different constituencies they exist to serve. These disparities can lead to fragmentation in decision-making and a weaker regional structure, impacting the value created by transportation networks. Our hypothesis is that improved metropolitan institutions and cooperation frameworks can establish better governance practices. These in turn can deliver more and better-quality goods and services to a public, increasing satisfaction and the political legitimacy of these institutions, reinforcing the inherent democratic nature of the system(Spink, Ward, & Wilson, 2012).

In the New York region, only one organization, the Port Authority of New York and New Jersey (PANYNJ) crosses state boundaries. MPOs do not cross state boundaries, hamstringing the region's ability to cooperate. The goal of this thesis is to explore the existing governance structures within the New York metropolitan area and their effectiveness at furthering transportation and development goals in the region.

1.3 The Impact of High-Speed Rail on Economic Development

High-speed rail (HSR) is currently in the spotlight as a major innovation for regional transport systems across the world. While some countries in Europe and Asia have had HSR systems for many years, many projects in North America and across the developing world are still in their infancy. HSR systems do not exist in a bubble, and it is vital to consider the relationship between these regional rail systems, and metropolitan and urban transport systems. The implementation of HSR in a new context can have major impacts on regional travel and economic development, not just because of new nodes of connectivity, but also because of the impact on capacity within the network. At capacity-constrained stations within the network, the addition of new HSR service impacts that level of service of existing rail services, but can also make new regional connections more convenient, opening up opportunities for new development.

High-speed rail adds an additional level of complexity to hub stations. In terms of both governance and physical form, HSR often has more complex governance structures and interactions, because of the mega-regional nature of service, and also has stringent physical needs due to speeds and scheduling. Stein (2013) examined the role of HSR as a "catalyst for governments to rethink regional identity, intergovernmental relationships, and competitive positioning". While her study focused primarily on national and regional government interaction, similar concepts can be applied to examining the role of multi-scale rail service at hub stations serving as catalysts for interagency and local cooperation.

The introduction of high-speed rail into regional transport systems complicates the question of regional identity and governance because of the increased connectivity, growth of the commuting shed and change in the perception of distance. It introduces new needs for regions to work together on economic development goals, and has the capacity to influence traditional forms of geographic economic competition. Including HSR within a regional rail model not only expands both the physical system and institutional sphere, but also increases the number and complexity of linkages between them. It requires rethinking who has power over which decisions and infrastructure, and how mega-regionality affects regional identity and governance. While regional thinking has been explored in metropolitan areas, decreasing the time between major metropolitan areas can be akin to linking them regionally.

Much of the work available regarding the economic development impacts of high-speed rail in the United States have been written from sources with a vested interest in the outcome of the analysis. Many academics and analysts have questioned the net economic development benefits of HSR (Levinson, 2012; Murakami & Cervero, 2010), but recognize possible arguments to be made regarding positive net economic impacts. While the benefits of high-speed rail may be mixed, regional transportation and connectivity are indisputably important in and to cities.

Levinson suggests that an argument can be made that high-speed rail would strengthen intercity linkages, transforming "the current metropolitan system into a megalopolitan system, where people more regularly interact between cities" (Levinson, 2012). However, the positive impacts of HSR on market expansion depends on whether it is competitive with other alternative transportation modes, such as automobile, airplane or bus, and whether users are able to be more productive (Levinson, 2012). There is also the possibility for agglomeration economies in the US, but the magnitude of these is uncertain. Murakami and Cervero found that the economic development impacts of the California HSR project are likely to be spatially redistributive rather than generative, but that HSR may

also help to strengthen the global competitiveness of the major urban centers in the state (Murakami & Cervero, 2010).

Another argument for high-speed rail is that it has the opportunity to act as an economic catalyst for regions not only by attracting new businesses but also by enabling the growth of the commuting shed beyond the bedroom communities and expanded (often) lower-cost housing options created by commuter rail (Paaswell, 2009).

Studies from Asia and Europe, however, offer more modest and inconclusive views of the economic impact of high-speed rail, though many still continue to invest in HSR on economic grounds. Studies from Japan have found that metropolitan growth and the presence of a Shinkansen station are correlated, but the causal structure is unclear (Brotchie, 1991; Hirota, 1984)hill . A study from Nakagawa & Hatoko (2007) have found that newer Shinkansen lines have not fared as well as earlier lines. Sands (1993) concludes that the "Shinkansen has shifted growth, but not induced it".

In Spain, the presence of a high-speed train improved accessibility in cities served by the train, but it was generally accompanied by a downgrading of conventional train services and air services. Also, it was found that there was "a reduction in the number of overnight stays", impacting tourist expenditure and the consumption of hotel services (Levinson, 2012). In Europe, the benefits of HSR have accrued primarily to major cities at the expense of smaller intermediate cities; major cities capture the majority of the accessibility benefits of HSR (Murakami & Cervero, 2010).

The United States has unique factors that impact the creation and success of a high-speed rail network. The current US rail network is primarily dedicated to freight; the growth of passenger rail may have an impact on the economic benefits associated with freight traffic. In many countries that currently have HSR, there was a pre-existing regional passenger rail network that the service was intended to complement. Outside of the Northeast Corridor and select other corridors, there is little effective regional passenger rail in the US. The relationship between HSR and regional and local transit services is an important area to explore. Finally, there are also opportunity costs associated with high-speed rail investment; money spent on high-speed rail cannot be spent on other projects.

Many agree that HSR in the United States requires pro-active policy making that can help support the potential positive benefits associated with the technology. These policy tools include changes in zoning, supportive infrastructure investments and governance that guides market shifts towards station catchment areas(Murakami & Cervero, 2010).

1.4 STRUCTURE

The remainder of this thesis is structured as follows:

Chapter 2 offers an overview of existing work in the area of regional transportation governance, models from around the world, and insight into work on the relationship between high-speed rail and local rail systems.

Chapter 3 discusses the existing regional transportation governance structures in the New York Metropolitan Area and the Northeast Corridor.

Chapter 4 introduces the case of New York's Pennsylvania Station and the Gateway Project as a means to discuss decision-making and governance in the region.

Chapter 5 introduces the institutional analysis framework used to model the existing structures and articulate existing gaps in governance.

Chapter 6 discusses the application of this framework to the case of Penn Station, and identifies the current challenges in governance.

Chapter 7 discusses potential opportunities and structures to address these governance challenges.

Chapter 8 concludes this thesis, summarizing the work that has been done, recommendations we put forth, as well as speculating on the future of changes needed at Penn Station and putting forth opportunities for future work.

2 LITERATURE REVIEW

There are three primary areas of planning and governance theory that are relevant to this research. This chapter will explore theory relating to (1) frameworks for the structure and organization of regional governance; (2) frameworks for understanding the effectiveness of regional governance; and (3) current work on the relationship between high-speed rail and local and metropolitan rail systems.

2.1 REGIONAL GOVERNANCE

The challenges that face metropolitan areas, such as transportation, maintaining clean air and water, and providing affordable housing, are largely regional in scale. However, there are few mechanisms in place enabling cooperation and coordination at this level. Governments, particularly in the United States, generally focus on federal, state or local issues.

There has been a growing body of research focused on the rationale for regional cooperation, looking at the growing interdependence between cities and suburbs (Feiock, 2013; Hill, Wolman, & Ford, 1995) and at alternatives to local government fragmentation (Orfield, 1997; Rusk, 1995). Hamilton, Miller and Paytas (2004) argue that focus on metropolitan areas comes out of a shift from a conceptual focus on government to one based around governance.

> ***GOVERNMENT VERSUS GOVERNANCE***
>
> Understanding the difference between government and governance is crucial in order to facilitate cooperation at the regional scale. Savitch and Vogel (2000, 161) define government as the "formal institutions and elections and [established] decision-making processes and administrative structures", while "governance conveys the notion that existing institutions can be harnessed in new ways, that cooperation can be carried out on a fluid and voluntary basis among localities, and that people can best regulate themselves through horizontally linked organizations". Hamilton et al. (2004) define governance as "the act of public decision making [that] is no longer the exclusive domain of a single government".

Historically, there have been three levels of government in the United States: federal, state and local. Metropolitan governance has emerged within this older system focused on

intergovernmental division of power, and represents an adaptation of the system. Metropolitan regions are generally "amorphous entit[ies] with no legal standing or political constituency". Citizens generally have a set of expectations about what government should provide, but "in most instances … are not concerned with which level of government provides their services as long as they are provided", however many metropolitan-level officials or authorities are unknown to citizens (Hamilton et al., 2004). Additionally, the connection between metropolitan authorities and other levels of government vary significantly both by state and region.

Hamilton et al. developed a diagram to depict the fundamental structure of the American intergovernmental system, shown in Figure 2-1. Their description includes the interactions between citizens, local governments, state government and federal government linked by administrative networks, financial flows and authority relationships.

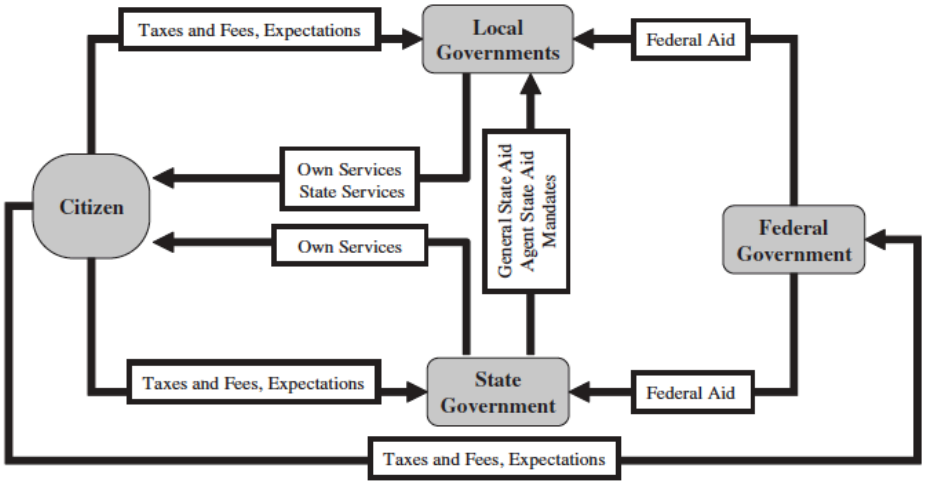

Figure 2-1: Model of Intergovernmental Relations (Hamilton et al., 2004)

Overlaying the role of metropolitan governance complicates the picture, and creates another layer to the diagram with loose flows between entities, shown in Figure 2-2. The boundaries of metropolitan authority and relationships are unclear and vary significantly among regions. However, they are greatly impacted by existing relationships between state and local governments. Metropolitan governance also brings into private and nonprofit organizations that together with public agencies form coalitions to modify public policies and agency operations (Alpert, Gainsborough, & Wallis, 2006).

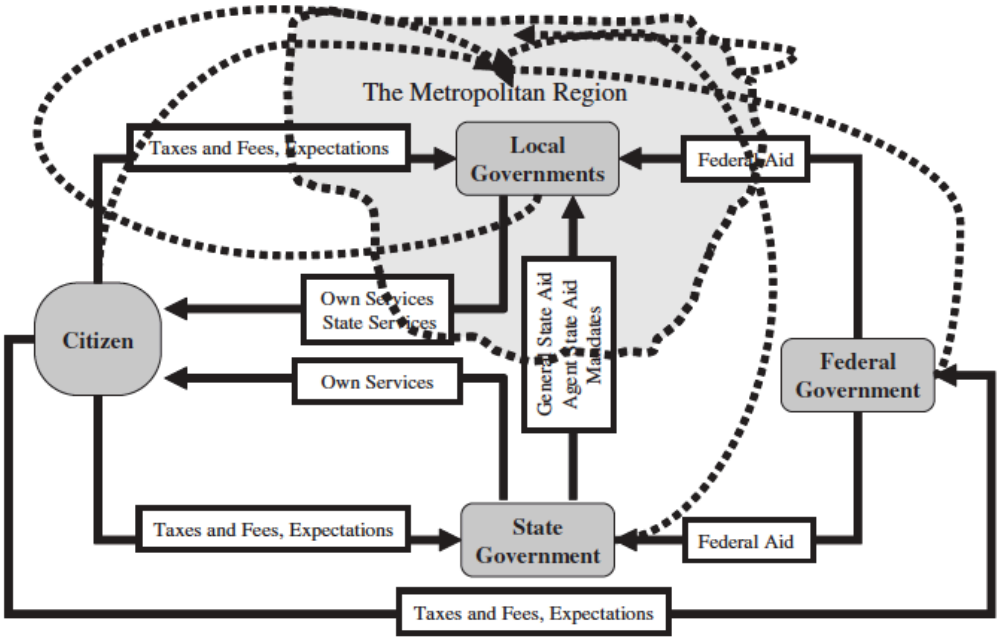

Figure 2-2: Model of Intergovernmental Relations in Metropolitan Regions (Hamilton et al., 2004)

State governments are often made up of officials who once were at the local level, and can be greatly influenced by official and unofficial means of divining local interests. The degree of centralization or decentralization of power to local governments influences the typology of a metropolitan region (Hamilton et al., 2004). Table 2-1 shows four typologies of metropolitan governance based on the relationship between state and local government (vertical) and between local governments (horizontal).

There have been opposing views debated by academics for over 50 years on the appropriate size and division of functions in local and metropolitan government in the United States and Europe (Hooghe & Marks, 2003). In his 1956 article, Tiebout asserted that "competition among multiple local jurisdictions leads to more efficient provision of local public services". Academics in favor of "the competitive city" (Mark Schneider, 1989) support flexible governance arrangements and overlapping, polycentric jurisdictions (V. Ostrom, Bish, & Ostrom, 1988). In contrast, consolidationists argue that collapsing overlapping jurisdictions into a limited number of municipal governments can improve efficiency and redistribution in municipal governance (Downs, 1994; Lowery & Lyons, 1989). With no conclusion on the division of function among federal, metropolitan and local governments, context is likely to play an important role.

Table 2-1: Typology of Governance Structure of Metropolitan Regions (adapted from (Hamilton et al., 2004).

	Horizontal Relations (Between Local Governments in a Metropolitan Area)		
Vertical Relations (between State and Local)	Centralized	→	Decentralized
	↓	State retains greater share of power; centralized Local Government Structure but Little Power	State retains considerable power; Multiple local governments but little power
	Decentralized	State devolves power to local governments, Empowered Centralized Local Government Structure dominated by a few	State devolves power to local government; Empowered decentralized local government structure

Regions can be located above, below, or across state levels (Van Langenhove, 2013). Regions can both support state efforts, but can also be given autonomy by state governments. Small states can join forces in order to create more powerful supra-national governance spaces, but larger states can also benefit by ceding some government control to a regional governance structure.

Although some metropolitan areas have been successful in creating metropolitan area-wide governments, notably Metro in Portland, Oregon, and the Metropolitan Council of the Twin Cities, there is general agreement that "metropolitan government has almost no political support", and that it is necessary to look at less formalized alternatives (Downs, 1994). While theory posits metropolitan planning as important, much of the current discussion focuses on facilitating regional *governance*, rather than creating regional *governments.*

The motivation for regional governance is very similar to that of regional government, but takes into consideration the challenges that face the creation of new institutions. Informal channels of cooperation are also key to the effectiveness of governance . Involved parties are not restricted to formal government bodies, but often include public, private and nonprofit organizations that form coalitions to change policy and agency operations. Many of these types of coalitions at the regional level take the form of a regional policy network.

The importance of metropolitan planning has been discussed extensively in the literature (Brenner, 2003; Castells, 1977; Lefèvre, 1998; V. Ostrom, Tiebout, & Warren, 1961).

2.1.1 Policy Networks

The concept of a network refers to nonhierarchical cooperative relationships between governmental and nongovernmental actors. Public policy research suggests that these types of coalitions are generally built on informal, horizontal or network-based structures. Informal relationships between individuals play a large role in many public policy decisions; Heclo notes "it is through networks of people who regard each other as knowledgeable, or at least needing to be answered, that public policy issues tend to be refined, evidence debated, and alternative options worked out – though rarely in any controlled, well-organized way" (Heclo, 1978). Particularly in transportation, there are high levels of movement between public and private sector, and between levels of government, influencing and facilitating the importance of informal relationships and coordination. Informal cooperation can be an advantage in a system in which formal structures or organizations can be difficult to create.

More recent definitions of policy networks have focused on the structure and benefits, as well as the necessary conditions for network emergence. Schneider & Stolz (2003) characterize network structures as having "high levels of interdependence involving multiple organizations, where formal lines of authority are blurred and where diverse policy actors are knitted together to focus on common problems". The horizontal dimension of network analysis is key to understand how individuals on the same level within different organizations create formal and informal relationships.

Cigler (2001) defines the necessary conditions for policy network emergence. The first is a level of resource dependency among actors; the second is a focusing event that can force local actors to recognize their resource dependence; the third is the presence of external agents, such as state or federal officials, which can help create incentives for cooperation. The fourth is the presence of a policy entrepreneur, and the final is the building of a political constituency for cooperation.

2.1.2 Transportation Governance

Regional transportation governance is inherently a multi-scale challenge, requiring the incorporation of both regional and local interests and actors. However, in the United States, regional governance has historically been a creature of the federal government, lacking support at the local level. The prevailing model of regional transportation governance in the US is the metropolitan planning organization (MPO), a loose structure designed to distribute federal and state transportation dollars among regional operators and facilities.

Transportation operators in the US are overwhelmingly vertically integrated modally, and also vertically silo-ed by mode, with little interaction between modal agencies or departments. Different sub-agencies operate distinct services with very little room for collaboration or horizontal integration. In many European systems, on the other hand, there is an overarching authority that sets schedules, fares and routes, but contracts out service operation to a variety of operators. These operators may consist of both public agencies and private organizations that operate a variety of services under the same brand.

2.1.3 Examples from Around the World

Hooghe & Marks (2003) focus on the European Union, discussing how multi-level governance should be organized, and whose needs should drive the organization of coordinating authorities. The label multi-level governance emerged out of studies of the European Union and is used to describe a "system of continuous negotiation among nested governments at several territorial tiers – supranational, national, regional and local" (Marks, 1993). While this model includes a supranational authority with no equivalent in the United States, experiences of coordination and authority design from the EU may be applicable when thinking about filling in "gaps" found in the governance structure in the New York Metropolitan Area. Evers & de Vries (2013) discuss different arrangements that can be used to govern across boundaries, including hierarchical approaches, competitive self-coordination and joint decision-making.

2.1.3.1 Regional Transportation Governance

Metropolitan Planning Organizations

MPOs were mandated by the federal government in the 1960s in order to try and solve coordination problems in regional transportation governance. They are the mechanism through which federal and state transportation dollars are distributed for regional transportation facilities (Nelson, Sanchez, Wolf, & Farquhar, 2004). However, there has been significant criticism (Calthorpe & Fulton, 2001; Solof, 1998) of MPOs. One such criticism is that they are often biased towards suburbs due to the one government, one vote model (Nelson et al., 2004). MPOs are empowered to distribute federal transportation funding, but lack implementation power. The general structure of transportation decision making and funding is shown in Figure 2-3.

The MPO model was strengthened in 1991 with the introduction of the Intermodal Surface Transportation Efficiency Act (ISTEA), which was enacted in an effort to bridge the gap between regional issues and local institutions by empowering Metropolitan Planning Organizations (MPOs) to play a more central role in regional decision-making. ISTEA contained a combination of institutional reform and new requirements for participation, and granted MPOs new power over spending in an attempt to shift power away from state

highway departments (Weir, Rongerude, & Ansell, 2008). While ISTEA was designed to empower MPOs to make some transportation project funding decisions, in effect it did little to shift the balance of decision-making. The goal of ISTEA was to emphasis building consensus among different regional interests, and build stronger linkages between transportation and other forms of metropolitan planning including land use and intermodal planning. An additional goal of reform was that a new institutional setting and the inclusion of new voices would help to alter the existing biases favoring sprawl (Weir et al., 2008).

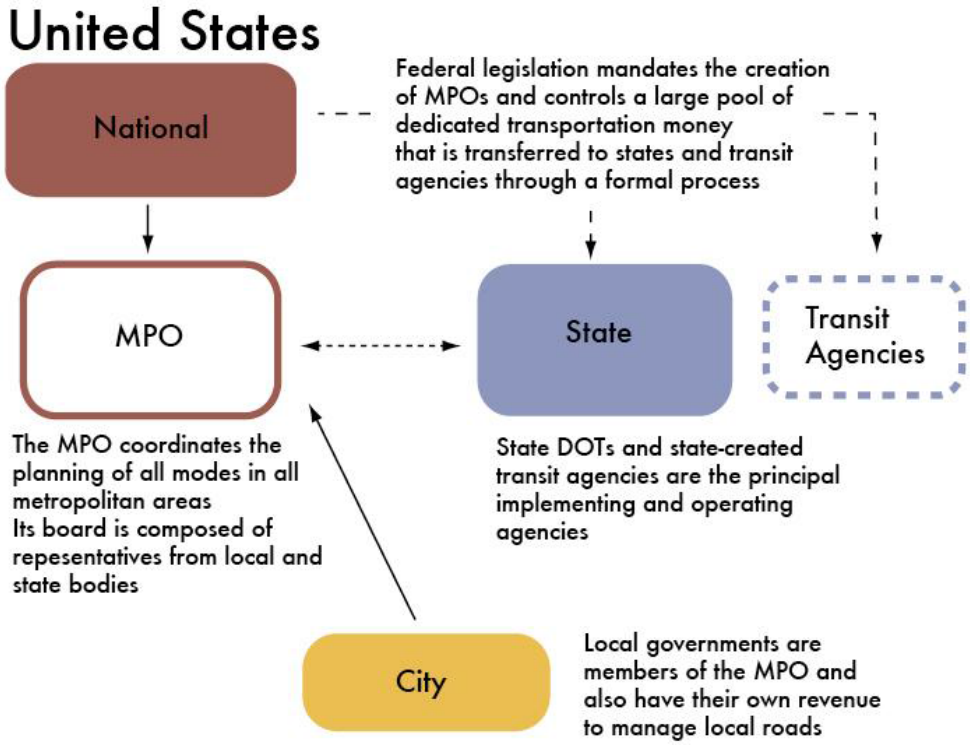

Figure 2-3: General overview of transportation governance in the United States (World Bank, 2011)

While MPOs were successful in bringing together new advocates beyond highway builders, real estate interests and developers, most assessments consider the impact of reform disappointing (Weir et al., 2008). Katz, Puentes, & Bernstein (2005) charge that one of the central problems was that although "ISTEA and TEA-21 were designed to move transportation decision making out of the back rooms and board rooms of the highway establishment, many state DOTs still wield considerable formal and informal power, retaining authority over substantial state transportation funds".

Moreover, this cooperation is based on the voluntary participation of other metropolitan interests. Intermodal improvements, for instance, is often poorly coordinated among agencies because of competition for funding and resources. Additionally, MPOs were required under ISTEA to have broader public participation, stipulating "early and continuous" public involvement in decision making, particularly for traditionally underserved populations. Additionally, land use is a major driver of transportation planning and decision-making but agency lies with local governments, while transportation decisions are often considered to be more regional issues, despite not always having the mechanisms in place to make truly regional decisions.

Portland Metro in Portland, Oregon, and the Twin Cities' Metro Council are considered to be two of the most effective MPOS. Both arose in their current configurations with significant agency to make decisions based on local initiatives, rather than federal.

GREATER LONDON AUTHORITY AND TRANSPORT FOR LONDON

Governance in the London region changed significantly with the passage of the Greater London Authority Act 1999 by Parliament. The Labour Party initially proposed the Greater London Authority (GLA) in 1996 saying London is the only Western capital without an elected city government. Following a referendum to confirm popular demand, there will be a new deal for London, with a strategic authority and a mayor, each directly elected. Both will speak up for the needs of the city and plan its future (Sandford, 2015).

The GLA established a directly elected Mayor for the City of London and also created a statutory body, Transport for London (TfL) to bring together most transportation functions. The act that created the GLA called for the Mayor to produce a transportation strategy that promotes and works together with the strategies for spatial and economic development, air quality and noise control. The Mayor was given the power to set the transportation budget and appoint the TfL board members and the Transport Commissioner. TfL is responsible for implementing the Mayor's Transport Strategy and manage all modes of transport service across the London region. TfL is run by a 14-member board; board members are appointed by the Mayor who is also the Board's Chair (Centre for Civic Governance, 2015).

From 1984 until the creation of the GLA, London Transport was under national government control. The London Regional Transport Act of 1984 required that London Transport set up subsidiary companies to run buses and the London Underground, and that contracts be competitively tendered.

TfL brought together the planning and operation of the London Underground, Docklands Light Railway, buses, trams, taxis and private hire vehicles, riverboat services, bike share

and cable car service in East London. Additionally, TfL is in charge of the TfL Road Network, a 580 km network of main roads, as well as the Traffic Control Systems Unit. TfL also administers the Low Emissions Zone (LEZ) and the Congestion Charge. There is a users' committee, now called London TravelWatch, which is appointed by and reports to the London Assembly.

With TfL and the GLA, "for the first time all transport management functions are now integrated under one controlling authority where traffic managers, police and bus controllers all sit together monitoring screens and taking coordinated action to keep London's roads flowing more easily" (TfL, 2003).

One exception to TfL's control of transport services is the heavy rail services coming into London, including the commuter rail. However, in January 2016 it was announced that the national government have backed a plan for TfL to take over operational control of the city's suburban commuter services. The goal of this plan is to deliver "integrated, seamless journeys for passengers both inside and outside of London" (Topham, 2016). Some inner-city heavy rail stations were taken over from the national rail and rebranded into Overground service in May of 2015. Since some national rail lines were rebranded as London Overground in 2008, passenger numbers have tripled (Topham, 2015). The eventual goal is for more than 80 percent of heavy rail stations in Greater London to have headways at 15 minutes or less, up from 67 percent today. While the national operator prioritizes longer distance trains to collect higher fares, TfL's contracts prioritize punctual train service and clean services, among other performance measures (Topham, 2015). The current Overground services are operated by the private firm, LOROL, a joint venture between the German rail firm Arriva and the operators of the Hong Kong Metro, MTR.

By bringing rail service under TfL's control and providing consistent information on the Tube map, as well as integrated ticketing within TfL's zonal structure, ridership and service standards are expected to increase. It is currently unclear where funding for upgrades and improvements on new lines would come from, but it is expected that some services could come under TfL control as soon as 2017 and 2018, while others may stretch until 2021.

THE GERMAN VERKEHRSVERBUND

Verkehrsverbünde are the prevalent system of integrated regional public transportation governance in Germany, Austria and Switzerland. A Verkehrsverbund is a "special public authority that fully coordinates public transport services in the region while preserving the individual identities of the component firms, which are still responsible for actually supplying the services" (Pucher & Kurth, 1996). The concept of a Verkehrsverbund was first introduced in Hamburg, Germany in the late 1960s, spurred by declining ridership, increasing car ownership and uncoordinated routes, stops, timetables and fares.

Government officials from three states, 140 cities and towns, and seven public transport firms came together to form the Hamburger Verkehrsverbund (HVV) in 1967 (Pucher & Kurth, 1996). The spread of metropolitan development towards the suburbs makes it a challenge to "integrate suburban services with city centre services to produce a truly coordinated, regional public transport system" (Pucher & Kurth, 1996). HVV was the first of its kind in the world and was created to ensure easy transfers, an integrated timetable, and the need for only one ticket to travel across Hamburg. In 2010, ninety percent of public transportation rides in Germany were provided by *Verkehrsverbünde* (Koch & Newmark, 2016).

The concept of a *Verkehrsverbünde* follows the model of cooperative competition, in which competing firms work together in order to achieve greater success. Individual transit firms as well as government entities are encouraged to engage in cooperative planning instead of directly competing with one another in order to improve the customer experience and attract more riders to the broader system. "The *Verkehrsverbund* model provides a useful example of how cooperation between public and private stakeholders in public transit can be encourage by legislation, and how such cooperation can improve transit service" (Koch & Newmark, 2016). A general overview of the organization of the *Verkehrsverbund* in Stuttgart, Germany is shown in Figure 2-4.

Verkehrsverbünde bring transport providers and government agencies together under a single umbrella and have two primary responsibilities: 1) develop a uniform fare structure, independent of transit providers, and 2) coordinate timetables and routes to reduce redundancy, service gaps and wait times (SPUR, 2015). By improving accessibility throughout a region and building a denser network, government subsidies are used more effectively, and in many regions, public transportation has gained a larger modal share (Koch & Newmark, 2016).

Public transport operators are still responsible for providing the services assigned to them, and determine the details of how the services are provided as well as the type of equipment used, the work schedules and maintenance schedules. Subsidies are based on route-km and vehicle-km of service provided, rather than on the operating deficit.

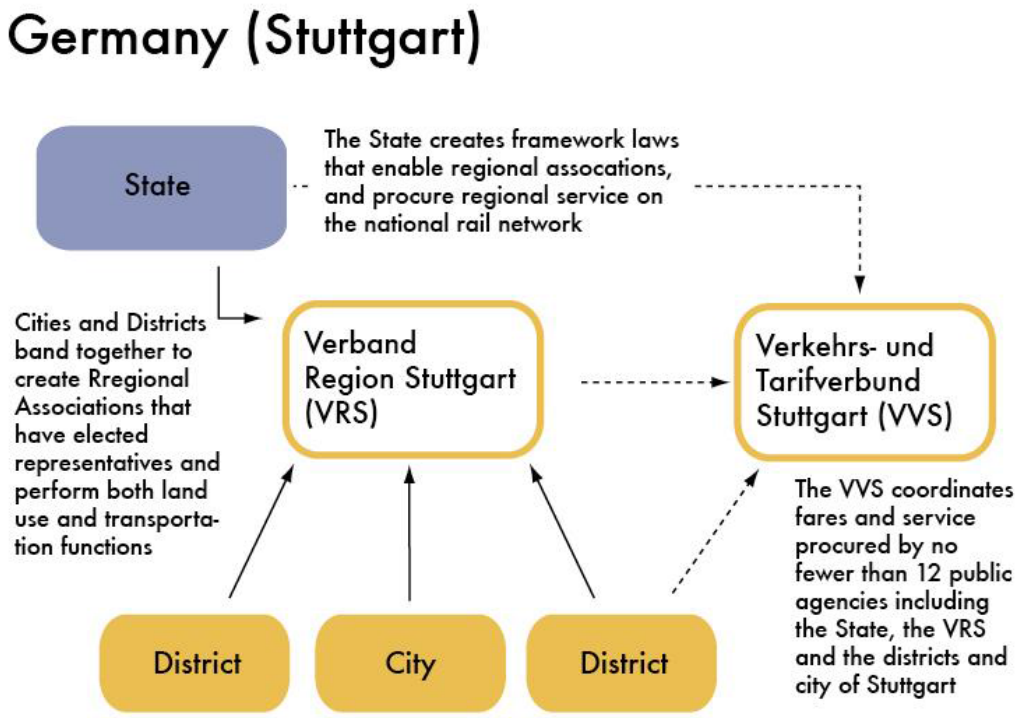

Figure 2-4: General overview of transportation governance in Stuttgart, Germany (World Bank, 2011)

In Germany, the federal government is responsible for the overarching transportation strategy while the sixteen states are in charge of logistics of planning, implementation, and management for most transportation projects. German intercity rail has been dominated by the national monopoly, Deutsche Bahn, intra-city public transportation included a mix of public and private operators even before liberalization in the late twentieth century. Market liberalization was part of an overall European Union push in the 1990s.

There are two primary structures of *Verkehrsverbünde*. The first is known as a "company alliance", shown in Figure 2-5, wherein public authorities engage with the *Verkehrsverbund* regularly, but are not members and do not sit on the board. Generally local authorities are in charge of managing the dispersal of operating subsidies and ensuring adherence to regional transportation plans, while the federal government disperses subsidies for infrastructure investment and discounted fares. In the second model, known as an "authority alliance", shown in Figure 2-6, the *Verkehrsverbund* is led by a local government entity, which takes an active role in shaping the alliance's policy and coordinating with service provider members (Koch & Newmark, 2016). The local government is in charge of subsidy dispersal, fare and route planning, and marketing coordination. The authority

alliance structure came into existence following federal transportation reform in 1993 that mandated regionalization.

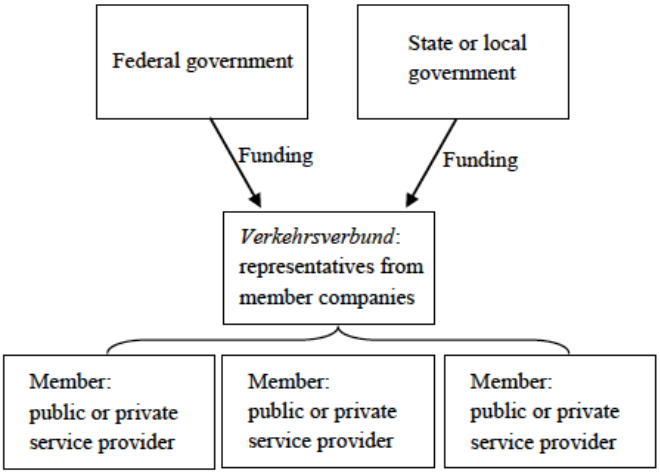

Figure 2-5: Basic structure of a company alliance *Verkehrsverbund* (Koch & Newmark, 2016)

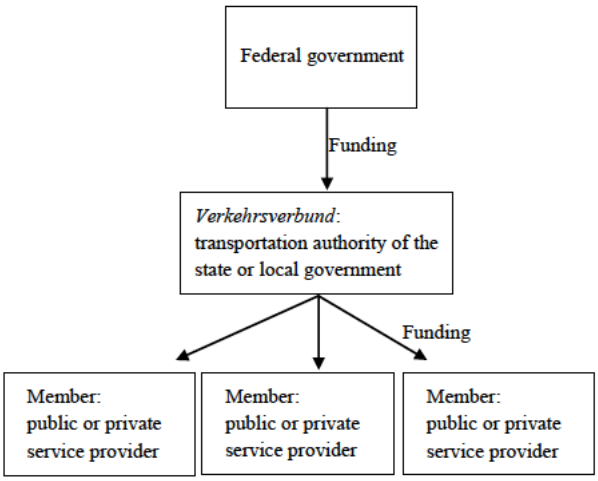

Figure 2-6: Basic structure of an authority alliance *Verkehrsverbund* (Koch & Newmark, 2016)

Legislation

In 1993, concurrent with the creation of the European Union and German reunification, a series of legislative reforms were passed that encouraged an increase in private market participation in public transportation as well as increased coordination among service

providers. It also required that all operations that were financially self-sufficient had to be contracted via competitive tendering, which shifted the administrative responsibility for transit subsidies from federal to state authorities. With this shift came an increase in the number of Verkehrsverbünde, which were created in order to perform the new administrative responsibilities required of the state. These reforms separate the two eras of public transportation regulation in Germany, as described previously.

Prior to 1993, public transportation was regulated primarily at the federal level, with funding from both federal and state governments; intercity travel was run entirely by Deutsche Bahn, the state monopoly. Table 2-2 summarizes the regulatory framework of public transportation prior to 1993, while Table 2-3 summarizes the regulatory framework after the reform of 1993. Table 2-4 summarizes the changing role of government in public transportation pre- and post-reform.

Table 2-2: Regulatory framework for public transportation in Germany, prior to transportation reform of 1993 (Koch & Newmark, 2016)

Legislation	Year	Key Elements
General Railway Act (Allgemeines Eisenbahngetz, AEG)	1951	• Defined local rail traffic as that which is undertaken primarily to serve urban, suburban, or regional demand – when the majority of trips taken on these services are shorter than fifty kilometers or one hour of total travel time.
Passenger Transportation Act (Personenbeforderungsgesetz, PBefG)	1961	• Effective starting 1964, regulates public transportation of passengers and covers all public transit, excluding intercity trains • Creates federal subsidies by way of discounted fares for students, the elderly, and disabled people
Municipal Transport Financing Act (Gemeindeverkehrsfinanzierungsgetz, GVFG)	1971	• In original iteration, earmarked revenue from mineral/oil tax for public transportation; initially only for infrastructure, but later included funding for bus (1987) and rail operations (1992) • Expires at end of 2019

Table 2-3: Regulatory framework for public transportation in Germany, including transportation reform of 1993 (Koch & Newmark, 2016)

Legislation	Year	Key Elements
Regionalization Act (Regionalisierunggesetz, RegG)	1993	• Starting in 1996, shifted authority for functions and financing of public transportation from federal to state government; funds distributed to states by federal government • Funds earmarked for public transit, disbursed by the state but funded by the federal government – "compensation" for the regionalization of rail services • States usually delegate disbursement to transportation associations/authorities • Funds primarily fund transport services, and rarely infrastructure investment
Railway Reorganization Act (Eisenbahnneuordungsgesetz, ENeuOG)	1993	• Amended the General Railways Act and made it the foundation for regional public passenger transportation • Amended the Passenger Transportation Act and made it the foundation for public passenger transportation, broadly • Begins to open market to privatization in two major ways: 1. The public companies (Deutsche Bahn and subsidiaries) that run public transportation services must now make their infrastructure (network, tracks) available to private competitors 2. Services that are not cost-covering must be put up for bids for contract
Municipal Transport Financing and Decentralization Act *(Entflechtungsgesetz)*	2007	• Replaced the GVFG, and provides €1.3 billion a year from the federal budget to the states for "investments for the improvement of transportation facilities" from 2007 until its expiration in 2019

Table 2-4: Changes in the role of government in public transportation pre- and post-reform (Koch & Newmark, 2016)

Pre-reform	Post-reform
Subsidies	
• State and regional governments funded and dispersed subsidies for transit operating costs • The federal government funded and dispersed subsidies for capital/infrastructure investment and for disabled/elderly/student fares • State-owned transit providers receive "cross-subsidization": subsidies from the profit of other utilities, such as energy • Federal subsidies (from GVFG) are restricted to programs that are integrated into a region's land-use planning, as determined by the state	• State governments (or regional authorities to which they delegate) fund and disburse subsidies for transit operating costs, and administer the disbursement of federal funds for capital/infrastructure investments and disabled/elderly/student fare discounts • State-owned transit providers receive "cross-subsidization" where utilities remain in public hands; any contracts not covered by these cross-subsidies are put out for public tender
Planning	
• The federal government determines the overall framework and policy structure of transportation planning for the country, but the task of planning is delegated to regional authorities • Regional authorities – at state, regional, or municipal levels – carry out the planning process, while the operational components are left to service provider-led *Verkehrsvebünde*	• The federal government determines an overall framework and policy structure, to enable consistency across the country; the task of planning is delegated to regional authorities • The regional authorities responsible for the logistics of planning are most often the (reformed, public authority-led) *Verkehrsverbünde,* which are then able to integrate operational considerations (e.g. fare structure) into their planning
Transit Provision	
• Regional authorities provision services required primarily from public providers, but occasionally from private firms in the denser areas in which they operate	• Regional authorities procure transit services from operators as before, but now any entrepreneurial activity by alliance members must be approved by the authorities that head the alliance • Regional authorities in mixed and responsible authorities *Verkehrsverbund* alliances determine and tender service contracts with member companies

REGIONAL WATER MANAGEMENT

Water resource management is a particularly challenging issue because it needs to manage environmental uncertainty, "uncertainty for planning", as well as process uncertainty, "uncertainty from planning" (Abbott, 2005). Water sources are not constrained to a single geographic entity, and local governance structures have a significant impact on the success of water resource management (Kim, Keane, & Bernard, 2015). Highly fragmented regional governance structures may have more interjurisdictional competition for new business or development, which has significant impacts on land use patterns, affecting water quantity, demand and quality. Several studies have found that political fragmentation can lead to lower densities and sprawl (Carruthers & Ulfarsson, 2002; Kim & Hewings, 2013). Fragmented political contexts also affect the ability to implement comprehensive zoning ordinances or water protection instruments.

The Case of California

The State of California introduced integrated regional water management (IRWM) in 2002 with the passage of the Integrated Regional Water Management Planning Act (SB 1672). Now there are forty-eight regional water management groups (RWMG) that cover 87% of the state's area and 99% of the population. A regional water management group is a group "in which three or more local agencies, at least two of which have statutory authority over water supply or water management, as well as those other persons who may be necessary for the development and implementation of a plan that meets the requirements of CWC §10540 and §10541, participate by means of a joint powers agreement, Memorandum of Understanding (MOU), or other written agreement, as appropriate, that is approved by the governing bodies of those local agencies" (Department of Water Resources, 2013).

The goal of IRWM is to "incorporate the physical, environmental, societal, economic, legal, and jurisdictional aspects of water management into regional solutions through open and collaborative stakeholder processes that promote sustainable water use" (Department of Water Resources, 2013). Similar to transportation, water management crosses jurisdictional boundaries and is critical to the quality of life in a region. Funding for RWMGs in California have come from state bond funds. Agencies across governmental levels are involved in water management, including federal, state and local agencies, as well as Native American Tribes.

2.2 EFFECTIVENESS OF GOVERNANCE

Good and effective governance is a difficult concept to define. There has been significant discussion in the literature on whether fragmented government precludes good transportation governance. Some argue that integration is necessary in order to achieve economies of scale and network integration, but others argue that, based on the principle

of subsidiarity, transportation matters should be handled at the local level (Berman 1994, Oates 2005). Subsidiarity is the organizing principle that states that functions, which subordinate or local organizations perform effectively, belong more properly to them than to a dominant central organization. Chisholm (1989) found for the San Francisco Bay Area that even with high levels of fragmentation, in some cases different levels of government can organize transport well.

Good governance starts with political legitimacy and accountability to the communities served. It is also important to account for how political and other institutions engage with governmental processes. There are five key principles that are generally agreed upon as fundamental to good governance, and important for the provision of regional transit services:

1. Coordination between agencies
2. Efficiency of service delivery and decision-making
3. Accountability to the public and other stakeholders
4. Responsiveness to local needs and preferences
5. Sufficient and sustainable revenue sources (Golden, 2014)

In order to measure the effectiveness of regional governance, it is important to understand the purpose. Historically, metropolitan-scale has been conflated with the regional scale and most research has interchangeably used the terms. However, the mega-regional scale is also at times referred to as regional, but has little literature on the term or on effectiveness of governance.

There are two primary justifications for thinking on the metropolitan-scale: economics and equity. The economic argument for metropolitan-scale thinking focuses on the benefits of agglomeration economies and economies of scale. These both are based on the idea that the consolidation of networks and flows of goods, services and people generate greater overall economic benefits than the existence of the individual businesses themselves. The equity argument notes that metropolitan-scale planning is better able to address the overall distribution of benefits and burdens than city-scale planning and reach a more equitable distribution of service delivery and resources. The quality of governance can be seen by looking at the relationships and policy networks established between governmental agencies, interest groups, private sector interests and advocacy organizations (Peters, 1998). In order to understand governance, it is necessary to focus on "the formal and informal arrangements that link together the organisations active in designing, delivering, and managing transport planning" (Legacy, Curtis, & Sturup, 2012).

Despite the benefits of metropolitan-scale planning, there can often be a mismatch between the reach and extent of the governance structure and the spatial footprint of a given region (Cenizal, 2015). At the metropolitan scale, there often exists policy networks, sets of informal and formal institutional linkages between governmental and other actors, structured around shared interests in public policymaking and implementation. The scale of these institutions does not always match; some are local, some state, some regional and some federal.

2.2.1 Theories of Cooperation

Public administration literature indicates that influential factors in decision-making are fragmentation at different levels of government and the way in which cooperation between these levels is organized. Other literature indicates that governance can be assessed by the outcome of the services it produces; a question that can be asked is whether the existing structure allows for actors to communicate to achieve their objectives. An NCSL-AASHTO survey of State Legislators and State DOTs indicated that "regular, open, honest, and transparent communication…is one of the most vital elements of effective transportation governance".

Meyer, Campbell, Leach, & Coogan (2005) define collaboration as "a purposeful process of working together to do any or all of the following: plan, create, solve problems, and manage activities". In large, complex transportation systems, groups of actors must work together in order to make decisions and achieve goals affecting regional transportation networks. Collaboration can reduce perceived mode barriers among users, and provide transparent regional travel information (Dacko & Spalteholz, 2014). In the US context, transportation authorities are often vertically siloed by mode, making intermodal collaboration more difficult due to competing operator objectives and possible competition for funding sources. Although collaboration in most cases can improve the customer experience, there are many other institutional challenges in place. Additionally, while many organizations and policy networks have informal cooperation mechanisms in place, it can be difficult to formalize cooperation across more senior levels of management.

Several researchers (Meyer, Campbell, Leach, & Coogan, 2005; Witbreuk, 2000; Zhang, Zomer, & Tavasszy, 2009) have explored the concept of effective cooperation, a key component of governance, and the factors that influence it. They note that there are several necessary conditions that have to be met to enable cooperation, including:

1. Situation interdependence;
2. Necessity of group effort for all stakeholders;
3. Defined and agreed upon goals;
4. Ability to measure progress

5. Ability to bear costs of cooperation; and
6. Stable environment.

The catalysts for collaboration can be varied. Some funding schemes (particularly federal or state grants) may require that stakeholders work together. Others, however, may encourage competition between stakeholders in a small regional area due to limited pools of funds. A public call for regional collaboration can also serve as a catalyst, and crises are often among the most successful catalysts of regional collaboration.

The public often does not differentiate between the roles of individual agencies in regional transport, but are generally more concerned with the overall quality of service. The lack of differentiation between ownership and service provision means that agencies may face criticism for issues or disruptions they have little direct control over. This can serve as another catalyst for collaboration.

Successful collaboration requires strong leadership. At large public agencies, this may require the head of the organization, or even the mayor of the city or governor of the state, to move the idea forward.

Often the most difficult steps in formalizing collaboration are the first. These steps start by organizations recognizing that collaboration may benefit the organization and help to further their own goals. The unequal distribution of power can also cause many difficulties in collaborative agreements and projects; those with more decision-making power may have less incentive to take into account the goals, needs and wants of other stakeholders. Formalizing collaboration agreements, particularly between public agencies, can also be challenging because of the scrutiny that agreements and policies undergo.

Collaboration can also be formal or informal. Formal collaboration would be dictated in the official policies of the involved organizations, while informal collaboration may take place among employees and be based on personal relationships or long work histories in the same field.

Witbreuk hypothesizes that the effectiveness of cooperation is affected by 8 main factors:

1. *Organizational design rules* – how are the various organizations set up?
2. Seriousness/type of problem – what are they collaborating on?
3. *Heterogeneity of interests* – how different are the interests among the actors?
4. *Size of group* – how many institutions are involved?
5. Heterogeneity characteristics – how do they differ?
6. Expected stability of group – does the group make up change?
7. Interaction between actors – how do actors interact?

8. *Reputation* – what is the reputation of a particular actor among the others in the group?

2.2.2 FRAGMENTATION

While in many systems, there are complicated relationships between transport operators competing for resources; an additional layer of complication present in some systems is the existence of state or international borders. The nature of rail service means that it is often authorized and funded by the public sector, and in many cases this limits the ability to operate and make decisions outside of a particular jurisdiction. In the US, this plays out most evidently in intercity rail decision-making, but also has an enormous impact on service provision in regions possibly including New York, Chicago, Minneapolis-St. Paul, and other major hub cities located near state borders. On the international scale, the impact of borders and their governance challenges is immense; in Europe, national rail associations have struggled to provide competent service across borders despite the presence of continental oversight organizations. The challenges facing cross-border service that often operates at a loss means that many countries are cutting back during tight financial times.

Some of the specific challenges facing international rail service include regulation and oversight, revenue allocation, ownership, staffing and equipment usage, among others. Rail operators are often siloed by geographic area, and lack the ability or jurisdiction to operate or expend funds beyond their scope. However, efficient service has the potential to change how people view accessibility and cross-border relations. These barriers to regional cooperation and coordination can have a significant impact on the feasibility of introducing new services, such as HSR, into an existing region or corridor.

Similar to national rail services in the Europe, rail service in the United States have been developed at a state level. This has led to fragmentation not only in technical systems, pricing, and governance and administration. Metropolitan fragmentation can also be a barrier to realizing urban agglomeration effects, considered to be one of the benefits for businesses locating in cities.

Similar to transport, "fragmentation of responsibilities and authorities is [considered to be] one of the main causes of recurrent failures in environmental planning and resource management" (Kim et al., 2015). Kim, Keane and Bernard argue that in some cases, individual actors cannot take a high enough level view of an issue or the associated incentives for cooperation without an explicit institutional arrangement promoting systematic cooperation, and that this may lead to undesirable outcomes for all due to their "parochial, myopic views".

2.3 Relationship between HSR and local and metropolitan rail systems

High-speed rail has been put forward as a sustainable solution for improving mobility within growing mega-regions, and to maintain the global economic competitiveness of cities and regions. Commuting patterns are changing, and it is no longer atypical to commute between metropolitan areas, rather than only between suburban and urban communities. However, capacity constraints and barriers, both physical and institutional, at major hub stations and within existing urban metropolitan transport services affect the ability to realize the proposed accessibility, mobility and agglomeration benefits associated with new high-speed rail projects (Hall & Pain, 2006; Melo, Graham, & Noland, 2010).

Janic emphasizes that "the successful development of intermodality, interconnectivity, and interoperability…needs to include the very precise identification of 'barriers'… 'strengths' and 'influences', and creating and implementing solutions for either their alleviation or removal" (Janic, 2001). Barriers are considered to include the built station environment, lack of fare integration, and long wait times, among others (Loukaitou-Sideris, Taylor, & Turley, 2015).

The available literature focuses primarily on intermodal competition across modes, and on intra-modal cooperation, but there is little available on intermodal cooperation and integration among operators of different transport modes (Givoni & Banister, 2006). (Wilson & Ferreira, 2006) examine connectivity of commuter rail and subway, while Tapiador et. al developed three indices to measure intermodality at high-speed rail stations. Some literature exists on the case of integration between air and rail could serve as a comparison for the integration of high-speed rail with local transport modes.

2.3.1 Station Design

Station design is often focused on aesthetics rather than functionality. Oftentimes concourses are better designed than platform areas, though the flow of passengers on platforms, and vertical circulation of the station can improve transfer times and transfer experience, ultimately lowering the perceived transfer penalty. Physical station attributes affect walking time and exerted effort, and ultimately perceived convenience and comfort.

Station design and layout have a significant impact on the level of service at transfer stations. It impacts not only congestion levels and passenger flow, but also the capacity of the station. Vertical circulation is also very important to consider – the flow of passengers from concourses to platforms is often a limiting factor in stations.

When considering existing stations, changes to the physical layout may be difficult to implement, but real-time information and coherent and integrated wayfinding can make

the user experience more relaxed. In addition, providing comfortable and well-designed passenger waiting areas and facilities can also improve the experience of an otherwise poorly designed station.

Connectivity between services can be facilitated through station design, and can encourage more use of transit services, particularly among choice riders, those who may otherwise opt to use private transportation. In stations with multiple operators, it can also encourage transfers between services that can open up travel opportunities previously thought to be less desirable. This can open up business opportunities in previously difficult to develop areas, and provide further local and regional economic benefit.

2.3.1.1 PHYSICAL OPERATIONS

There is substantial literature on technical and computational solutions to understanding passenger flow, but little work has addressed how institutional and political factors affect station design.

There are many different departments within an agency who are designated to consider customer experience, and this may vary at different stages of a transit station project. Even within a single agency, there is often compartmentalization of specialized knowledge, particularly between analysis, design and implementation stages. For functions such as emergency evacuations, there is often separate department designated to handle these considerations; provisions for this type of use may conflict with day-to-day operations of a station, but there is not always joint planning that occurs to handle it. Additionally, work is often divided between agency staff and outside consultants. Data collection is often done in-house, while designing passenger-serving station areas is often done by outside consultants.

2.3.1.1.1 THROUGH-RUNNING

Depending on the physical location and demand of a station, through-running may cause challenges in passenger flows because it affects the previously directional flow of passengers. In the case of limited vertical circulation, there may be bottlenecks at vertical circulation elements due to the bi-directional demand of passengers.

2.3.1.1.2 PLATFORM SPACE

Platforms must accommodate passengers arriving and departing from the station, waiting for vehicles, boarding and alighting, and transferring between vehicles or lines. In many cases, transit stations were designed many decades ago and may not have been built to handle current capacities. Platform width is considered to be an important feature of station design; if not built to accommodate the largest numbers of passengers expected,

then safety may be compromised. Support columns can reduce the amount of circulation space on a platform and affect passenger flows (Connor, n.d.).

Station platform capacity can be increased by dispersing passengers more evenly along the entire length of the platform, in the short-term. Longer-term solutions may include removing obstacles such as columns or platform furniture, or widening the platform.

2.3.1.1.3 VERTICAL CIRCULATION

Many transit agencies attempt to improve pedestrian flows and reduce crowding in particular areas of the station. In a study conducted by the Mineta Transportation Institute, agencies reported that station platforms and vertical circulation elements were the most crowded. Vertical circulation elements include escalators, stairs and elevators.

Vertical circulation can be improved by encouraging one-way flows, changing escalator speeds, or installing multidirectional escalators. More costly is adding additional vertical circulation elements. Peak flows tend to be directional; escalators can be used to direct passengers in the peak direction, increasing capacity.

The location of vertical circulation elements also matters; if passengers all want to exit at the north end of a station due to their office location, adding additional southern capacity will do little to alleviate crowding.

2.3.1.2 CUSTOMER EXPERIENCE

2.3.1.2.1 WAYFINDING

Commuter stations are often used differently than those for intercity travel; regular commuters tend to follow habitual routes to reach the same destinations every day. A passenger's experience often begins at a street adjacent to a station, before using a stairway or escalator to reach a below-grade station. Regular commuters may pay less attention to wayfinding signs and instructions, and rely on experience to reach their platforms and destinations.

However, tourists and infrequent riders may rely more on wayfinding signage, and may also cause congestion within a station for regular commuters when they do not know where to go. Additionally, wayfinding can also be important for special events during unusually high passenger volumes that may include more rowdy customers. Extra signage or staff members may be necessary to assist novice passengers to expedite crowd movements.

Wayfinding infrastructure such as barrier walls, information signs and stairways may also serve to block sightlines and visibility for passengers or security during off-peak hours.

Iseki and Taylor "found that transit riders tend to value a feeling of safety at night more highly than most other characteristics of the transit experience, such as convenience and reliability".

2.3.1.2.2 TRANSFERS

Transfers allow for connections within and between modes, expanding service areas and the trip options available to users. They can facilitate regional development by enabling broader connectivity and increased commuter sheds. However, transfers within a network can also deter potential customers and reduce public transportation's competitiveness with automobiles that provide door-to-door service. A study by Wardman & Hine (2000) found that convenient transferring is the top concern for auto drivers to switch to transit.

When there are multiple operators in a region, transfers become more complicated. One major challenge is the organizational barrier that exists when transfers take place between services provided by separate agencies. Each agency often has its own governance structure, funding sources and service priorities. In many cases, particularly in the United States, modes are siloed and run independently. This challenge is magnified in cases complicated by borders and lack of regional governance structure, such as the New York Metropolitan Area. It is also difficult to restructure the attributes of transfers in a system once the system is built. Hub stations may not have been designed with efficient and comfortable transfers in mind, particularly in regions with long-time services. Additionally, service delivery from operators is often not linked to the operation of transfer facilities including stops and stations.

At hub stations, another challenge is incorporating transfer attributes with traditional time and cost factors used to evaluate transportation networks. The impact of station design on transfer quality has not been researched extensively. System improvements are often based on travel timesavings, but increased connectivity through transfers does not necessarily lead to higher usage. Out-of-vehicle time are perceived to be more onerous than in-vehicle time by transit users (Ceder, Chowdhury, Taghipouran, & Olsen, 2013) some travelers will choose a longer one-seat ride than a shorter trip that includes a transfer.

2.3.1.2.2.1 TRANSFER ASSESSMENT

There are many ways to assess the quality of a transfer and its impact on the passenger experience and overall system, but few operators specify objectives for transfers in their service planning. A 1996 survey conducted by the Federal Transit Administration (FTA) found that only 3 out of 31 operators incorporated objectives regarding passenger or

operating convenience and transfers, or the impact of transfers on revenue generation, into their transportation surveys; only 3 operators considered transfers as part of their service delivery objectives (Guo, 2006). Many operators do not count the number of transfers that take place within their system, nor do they incorporate transfer planning into service planning directives.

Traditionally research on transfers has focused on travel timesavings, rather than on travel quality and ambiance. Travel timesavings are used to justify transfer improvements, but do not take into account users who may switch modes away from public transportation if the overall travel experience was not pleasant. Most studies produce an average assessment for the entire system using mode choice models and stated preference surveys. A system-wide assessment, however, does not help to identify problematic stations or pinpoint priority investments.

A focus on how to incorporate components of transfer penalties into investment decisions could help to provide region-wide benefits by making changes at the station level. Improved transfer experience could help to open up accessibility in the region, ultimately leading to potential benefits for individuals, businesses and local governments.

In order to better understand the role of transfer facilities in regional transportation systems, there are two relevant perspectives to consider. The first is the personal transfer experience from the user's perspective, and the second is to understand the transfers from the operator perspective. Beyond general understanding of transfers, it is also important to look at cross-system and -mode transfers specifically. The coordination needed between operators and agencies to align regional transport systems differs from that necessary for transfers within an urban transport system, for example.

2.3.1.2.2.2 USER TRANSFER EXPERIENCE

From the customer perspective, the quality of a trip, and the choice of which mode to use is not just about overall travel time, but also about convenience, comfort and safety, among other factors. Therefore it is important to consider how a transfer affects users' overall experience, mode choice, and satisfaction with a trip. For users', there are three main components to a transfer: *transfer walking*, *transfer waiting* and the *transfer penalty* (Guo, 2006).

Transfer walking time is defined by the network and station design, and is the amount of time it takes to walk between services. The penalty for walking between services can be mitigated by escalators, ramps and same-level interchanges. *Transfer waiting time* is determined by service operation and management, and service scheduling. It is the

amount of time a user has to wait to move for the next service after alighting from a vehicle. In stations with little schedule or service coordination, transfer waiting times may be more onerous for passengers. Finally, *transfer penalties* are the most subjective of these three measures. A transfer penalty is a disutility function designed to quantify the inconvenience and disruption that transfers pose.

Wilson and Ferreira (2006) note that there are two components to the "penalty" of a transfer. The first is the "opportunity cost of additional travel time spent on transfers that otherwise could be spent on work or leisure" and the second is the "(dis)utility of the transfer itself". The opportunity cost is more easily defined, and can include factors such as additional travel time and fare associated with a transfer. The second component is more subjective; Wilson and Ferreira use random coefficient techniques in mixed logit discrete choice models to address the utility factor.

Otúzar & Willumsen (1995) include the psychological impact of transfers and the transfer environment into their definition of transfer penalties. Transfer experience is affected by factors including:

- safety and security
- ease of way-finding during transfers
- transfer station design
- availability of escalators
- weather protection
- seating availability
- variance of walk time
- lighting
- burden of luggage
- air conditioning and ventilation
- concessions on the platform

(Iseki & Taylor, 2010) found that perceived waiting time is more onerous than actual waiting time. Public transport users tend to overestimate transfer and waiting times, but perceived waiting times depend on conditions such as reliability, comfort and personal safety, in addition to the characteristics listed above as part of transfer penalties.

Mishra, Welch, & Jha (2012) define transit connectivity to include factors related to service quality, such as walking distance, in-vehicle travel time, waiting time, number of destinations served and number of transfers needed to reach destinations. Connectivity is

used as a performance measure to quantify and evaluate transit performance. The paper also provides a measure of system performance with low data requirements.

A user preference survey by Ceder et. al (2013) found that transit users exhibit risk averse behavior when making decisions on travel routes with transfers. Uncertainty in the out-of-vehicle times decrease the attractiveness of travel routes, and can push potential riders away from public transport, particularly for users making complex trips. Few researchers (Guo & Wilson, 2011; Hadas & Ranjitkar, 2012) have discussed the role that the quality of transfer connectivity plays in attracting transit users and maintaining existing users. Improvements in transfer quality may affect users' travel behavior and ridership levels (Iseki & Taylor, 2010). Guo and Wilson used the London Underground as a case study to study transfer inconvenience cost using path, transfer time and the presence of stairs, escalators, elevators etc.

Studies have shown that high quality information systems can help to increase ridership, retain existing riders and improve the reliability in urban and interurban transportation networks (Ceder et al., 2013). Guo and Wilson found that comfort at a transfer terminal is an important factor in users' perceived ease of transfers. Ceder et. al (2013) found attractive transfer routes are those that promote reliability and little variability in out-of-vehicle times.

A lack of coordination between operators in way-finding and physical connections likely can lead to an increase in the perceived penalty for transfers at the station. Studies have found that users are less likely to use regional rail services (such as commuter rail) if their destination is not within walking distance of the station (Wilson & Ferreira, 2006). This is partly because a transfer at an urban station is often the second transfer in a trip; the first is the transfer from a private vehicle to a railcar at the origin station. While the magnitude of this penalty is unknown in comparison to that caused by roadway congestion, tolls or access to other modes of transport, mitigating the penalty at transfer hubs may help to increase ridership, and improve connectivity in the region. This is vital when thinking about the role of hub stations within broader regional transport networks. Further work also is needed to see whether this finding holds true for transfers between intercity service, such as HSR, and local connections.

2.3.1.2.2.3 The Operator Perspective: Transfer Supply

From an operators' perspective, transfer supply includes station design, social environment and service management (Guo & Wilson, 2011). A supply assessment is a comprehensive inventory and ranking of all aspects of a transfer supply in order to better understand transfer behavior as well as the existing condition of transfer facilities.

Supply assessments are generally a list of factors generated by stakeholders that are considered important to transfer facilities. In Europe, stakeholder input is collected primarily from experts, whereas in the US, the list of stakeholders is broader, often including passengers, government officials and local residents.

Guo and Wilson identified the 2002 Transport for London Interchange Plan as the most comprehensive example of a supply assessment of transfers. The plan evaluated over 600 facilities in London for policy value and quality value in order to build a Quality Gap index for transfer facilities. Policy values were based on policy objectives laid out in the Mayor's Transport Strategy, while quality values included appearance, accessibility, environmental quality, security, information and staff. Transfer facilities were prioritized for investment by looking at the difference between the policy and physical values; those with a high Quality Gap (high policy value but low physical quality) were prioritized.

It is important to understand transfers because they affect network accessibility, and ultimately regional development. As users make the choice to take an alternative path, alternative mode or avoid a trip all together, this can have major regional effects.

2.3.1.2.2.4 CROSS-SYSTEM TRANSFERS

There is little literature available on cross-system transfers; much of the work on transfer design and theory is limited to a single mode, primarily subway. The most notable researchers on cross-system transfers are Guo and Wilson, who looked primarily at commuter rail-subway transfers in Boston. In Boston, 33% of commuter rail passengers transfer to subway after egress at downtown stations (Guo & Wilson, 2011). Transfer behavior between systems is often more complicated than within a system because of differences in fare systems, service reliability, and network familiarity among riders, as well as lack of schedule coordination among operators. However, these transfers are important because commuter rail systems often have few stops in center cities, and many current and potential riders rely on other systems within transit networks to get to their final destinations.

Transfers between local or commuter service and HSR may follow different patterns because as the concept of distance and time change in travel, it is possible that travel patterns and behaviors will change. It is likely that some of these changes will rely on reliable connections between intercity, regional and transit services, and coordination among different operators. Many intercity rail passengers use feeder services (such as subway, bus or commuter rail) to access a multi-modal transit hub; thus it is vital to

understand how waiting tolerance and behavior is affected both by the relationship of the service characteristics of the feeder and primary services (Hsu, 2010).

Additionally, modal planning has traditionally been focused on modal choice for an individual, but there has been little research on why and how people mix modes and choose "different combinations at different times" (Guo & Wilson, 2011). In addition to travel time savings, another important factor for passengers in cross-system transfers is the fare and ticketing experience. Transfers between agencies often involve more than one fare structure and ticketing system, increasing the cost and complexity of the travel experience even for frequent riders. The effects of fares and ticketing have been noted, but have not been looked at in quantitative studies.

Wilson & Ferreira (2006) found that commuter rail-to-subway transfers, based on Boston research, were consistently more negatively perceived than subway-to-subway transfers. Previous research had found that the subway-to-subway transfer penalty in the Boston system was 7.3 minutes, while the commuter rail-to-subway transfer penalty ranged from 8.5 to 17 minutes, dependent on the transfer station used. The authors speculate this is due to longer transfer walks, more complicated modal connections, and the monetary costs of transfers. Of the three observed stations, North Station, South Station and Back Bay Station, Back Bay Station was found to have the lowest transfer penalty because of short walking distances between platforms, simple connection paths and escalators.

The research also found a difference in transfer penalties between frequent and infrequent riders, as well as pass holders. The authors also found that the variation of the transfer penalty originates more from observable factors such as service quality, station design and demographic characteristics than from unobservable characteristics such as the attitudes, preferences and perceptions of passengers. (Chien, 2005) additionally found that the mean transfer waiting time of passengers who use local transit services to access a hub station is heavily dependent on the level of coordination between intercity rail operators and local transit operators.

Many commuters do not want to switch a second time to another mode of transport. Oftentimes suburban commuters drive to a railway station in order to take a train into the city, but Hutchinson found that for daily commuters, egress time from the transit system to an office is more important than access time to the transit system from their home. According to Clever (2011), many office workers are only willing to take public transport if they can walk to their destination. Figure 2-7 below indicates the components of total travel time, but does not include access and egress times. An important question is to unpack what factors might impact this choice, and whether it is related to the transfer facility that a train arrives into. This behavior may have a large impact on the ability of a

public transportation system to serve regionally and cut down on automobile use across a metropolitan area. It is important to look at the job shed within 400 meters of a station, a distance that most literature has found to be considered a walkable distance.

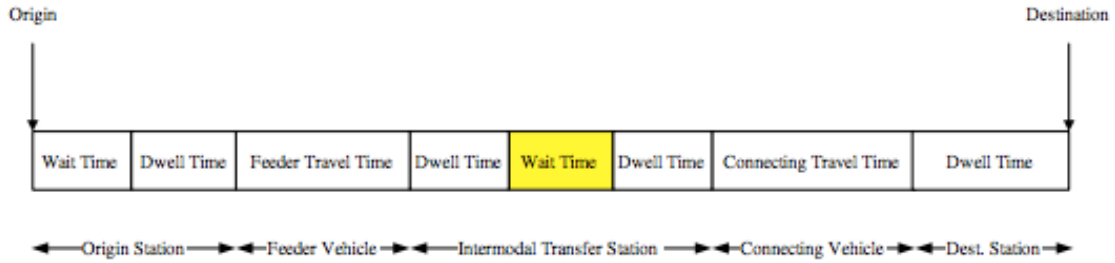

Figure 2-7: Components of Total Travel Time (Hsu, 2010)

2.3.1.2.2.5 TRANSFERS AND STATION DESIGN

Many transfer facilities are optimized for operational expediency for agencies, not for ease of transfer for customers. Clever termed this type of station design "intermodal terminal with agency demarcation lines", the state of practice in most of the US. Penn Station is a classic example of this station type, with each agency operating independently in its own space. In comparison, many European systems operate with station designs better optimized for ease of transfer and passenger experience. Some simply do not have agency demarcation lines, often because of government requirements for common regional fare systems and coordinated schedules. In more organized systems, commuter trains converge onto a central axis through downtown with stations located in areas of highest trip end density. This station type can be seen in cities such as Paris or Seoul in order to take advantage of the typical walking shed of transit to bring travellers to the highest demand destinations. This design can maximize ridership, but also has operational advantages compared to a stub-end station. With a three-minute headway, the throughput can be 20 trains per hour per directions for a 2-track station.

A more integrated system is the Pulsed Hub system, which offers integrated timed transfers at many hubs through a country or region, not just at a single hub. This type of system is designed to minimize both the transfer time, as well as the number of transfers (Clever, 2006). The best example of this is the transport system in Switzerland. It requires high levels of schedule reliability, often considered unachievable in the United States due to passenger trains sharing track with freight trains. This type of system not only integrates systems spatially, but also temporally.

In the US, integration of high-speed rail with urban and regional transportation is even more critical than in many other HSR markets. There is a weak rail culture in the United States, and HSR will compete primarily with air service. A criticism of air service is the

access and egress time of airports, including distance from the city, security time, buffer time etc. Rail has been shown to be able to compete with air service because it can offer more door-to-door service. However, the challenges of integrating air and high-speed rail systems can mirror the challenges with integrating and coordinating high-speed rail and commuter rail services. Intercity and commuter rail are governed differently, with different operating objectives, and different governance structures. The services can compete for limited transportation funding in the United States.

However, many existing HSR services, particularly in Asia and Europe, come into places with a culture of public transportation and rail service. In the United States, HSR is likely be introduced in markets lacking a culture of rail use. At Penn Station, it is likely that many HSR users would come from within the metropolitan region, including Long Island and New Jersey, and in order to make HSR attractive, it is vital that connections be coordinated with the existing regional rail service. Amtrak currently operates with little consideration of NJT and LIRR, with the exception of available tunnel capacity under the Hudson.

In addition to the bigger picture questions of integration, there are other questions to consider with HSR. One is a question of luggage and its impact on mode choice; another is a question of security. A study by Harvey found that the deterrent to using public transit as an airport access mode is correlated with the amount of luggage. The study found that the implied cost of each additional piece of luggage was $11.17 for non-business travelers (Clever, 2011).

Another challenge that American HSR faces is that of security screening. While there are no formal plans yet for HSR station design in the Northeast Corridor, HSR in California is at a later planning stage. Californian HSR stations are being designed to include airport style security screening, something unprecedented worldwide. Implementing this type of screening brings into question the ability to leverage connections and synergies with local and regional transportation systems. Security screening may impact not only travel times and connections, but also station design and comfort.

2.3.2 Fare Integration

From the customer perspective, regional fare integration helps create a seamless system. In practice, fare integration between multiple agencies can be difficult to implement. One key consideration is the type of technology used for fare collection, such as smartcards or mobile phone payment, and the requirements for new infrastructure to support new technology. The implementation of this system also comes at a capital cost; someone must be responsible for implementing these changes and how will costs be divided. Additionally,

from the agency perspective, it is important that there be a transparent and rational system for dividing revenues between cooperating agencies.

There are two general strategies for regional payment integration. The first is to develop a common fare structure (e.g. regional passes, free or reduced interagency transfers). This strategy would create a zone-like system in which travel within a given zone costs the same regardless of directionality or destination. This is thought to provide more flexibility and transparency for travelers, and can help tie together different agencies into a single transportation brand. The second strategy is to allow each agency to retain their own fare structure, but all agencies accept a common stored value. Integrating multiple agencies often requires complex partnership agreements in order to establish the responsibilities, ownership and allocation methods of costs and revenues. The management of a back-end payment settlement system also needs to be decided (Fleishman, 2010).

Some systems have moved beyond just integrating transit systems into a common payment system. The Octopus Card in Hong Kong is a smart card-based system accepted by eight bus, rail and ferry operators. Today, there are more than 10 million daily transactions and it is used by 95 percent of the Hong Kong population. The Octopus card is also accepted at many retail establishments and can also be used for parking. In London, the Oyster Card is a privately financed and operated smart card-based regional fare payment system with 30 banks involved. TfL uses a “best fare” arrangement in which there is a daily “cap” for travel expenditures.

3 Regional Transportation Governance in the New York Metropolitan Region

The goal of this chapter is to provide an overview of regional transportation governance in the New York Metropolitan Area and provide background on key stakeholders in the institutional landscape to provide background for further discussion and analysis in chapters 4 and 5.

3.1 Transportation and Governance Complexity in the New York Metropolitan Region

The New York metropolitan area has one of the largest and most complex transportation systems in the country. The region faces major challenges with service coordination among operators, as well as funding uncertainty for transportation. Many of these challenges stem from the complicated governance structure of transportation in the region, including *seven* independent sub-agencies within the MTA, the main transportation operator, alone. The region has a complex transportation network with a long and complex history, run by many different operators. Beyond just transportation operators, there are three states, 31 counties and 783 municipalities involved in governance and decision-making (Regional Plan Association, 2014).

Public transportation aims to efficiently move passengers throughout a metropolitan economy. Building new rail lines, raising more funding, or merging entities are useful only if it helps to provide the kind of service that meets the needs of system users. However, in a region such as New York that serves a wide range of users, establishing what the needs of system users are can be difficult, and can differ among operators.

In the New York metro region, consisting of New York City, its suburbs, northern New Jersey and southern Connecticut, over 30% of the population relies on public transportation to get to work, and the system has more unlinked[1] transit trips than the next 16 largest U.S. systems combined (Eno & Transit Center, 2014). Although the region extends into three states, New York City is the center of the network. The city itself

[1] A trip involving a transfer between modes is counted as two trips.

contains 37 percent of the region's population, and 59 percent of the population reside in New York State (Eno & Transit Center, 2014). The regional transit network has three separate commuter rail systems, two subway systems (New York City Transit, run by the MTA, and the PATH train run by the PANYNJ), and light rail in addition to the nation's largest bus network, ferries and an aerial tram. The region also has the highest percentage of supercommuters[2] in the country.

Highlighting the challenges of coordination was the lack of an official regional rail map; an official rail network map was only released in 2014 by NJ Transit and the MTA. Figure 3-1 shows the unofficial map of the region's railway network.

State boundaries, along with institutional divisions, intensify divisions between operators. These divisions stem from the private companies that originally created the public transportation system to benefit real estate development. Whereas in many regions municipalities took control of transit systems, in New York City, the state government took control. In New York City, the governor has the power to make major decisions over the subway system, not the mayor. The federal government introduced a form of regional governance, the metropolitan planning organization, in the 1960s, but in the New York region, attempts to bring actors together at the metropolitan scale failed, and ultimately there are eight separate MPOs in the broader New York metropolitan region.

[2] Defined as a one-way commute of over 90 minutes.

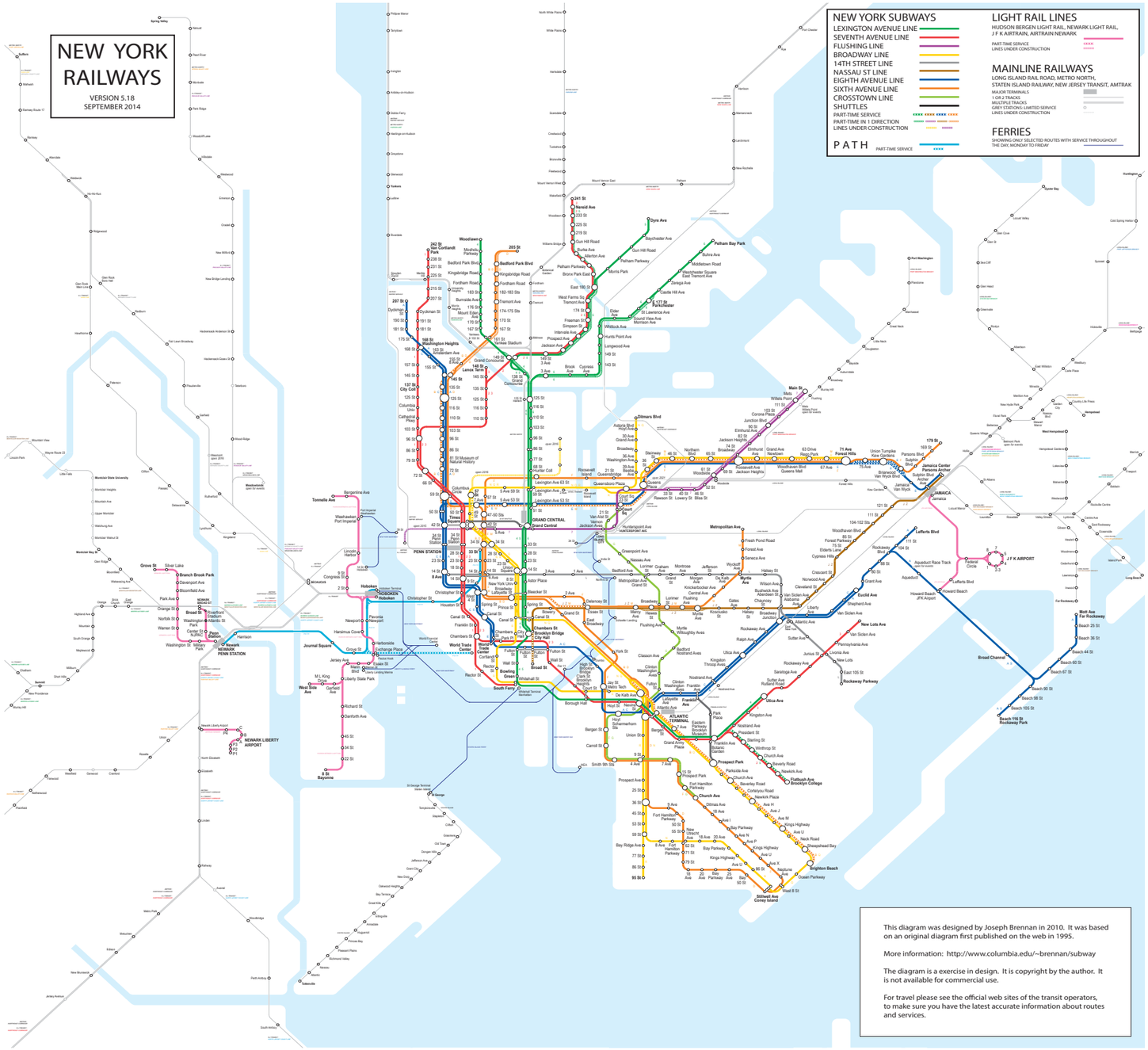

Figure 3-1: New York Railway Diagram (Brennan, 2014)

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The four main rail operators are Amtrak, New York Metropolitan Transportation Authority (MTA), New Jersey Transit (NJ TRANSIT) and the Port Authority of New York and New Jersey (PANYNJ). The largest of the four is the MTA, created in 1968. The MTA runs two distinct commuter railroads, Metro-North Railroad, which has a terminal at Grand Central Terminal, and Long Island Rail Road, which has its terminal at Penn Station. Further detail is provided on the MTA in Section 3.2.5.2.

The MTA is a public benefit corporation, a public corporation chartered by a state to perform some public benefit, within the State of New York. It is responsible for developing and implementing transit policy for New York City and the seven counties surrounding the city that are located within the state. As it is not an official state agency, the MTA does not receive annual funding allocations, but instead relies on state funding on a five-year cycle for its capital plans.

The main railway stations in the region are New York Penn Station, Grand Central Terminal, Newark Penn Station and Secaucus Junction. While Grand Central Terminal currently only houses Metro-North until the expected completion of the East Side Access project in 2022, New York Penn Station is home to four different rail operators: Amtrak, New Jersey Transit, Long Island Rail Road and New York City Transit. This presents increased levels of operational and governance complexity. Newark Penn Station and Secaucus Junction are the major stations on the New Jersey side. Newark Penn Station serves NJ Transit and Amtrak, while Secaucus Junction opened in 2003 to serve as a major transfer hub for NJ Transit service into Manhattan.

In New York, individual transit agencies are far more powerful than metropolitan planning organizations. The lack of federal policy on cross-city lines, or transport efficiency has led to independent stations at a higher cost than a single cross-city line. Historic resistance to regional cooperation makes it difficult to propose regional projects, but history informs the current state of governance at Penn Station. In order to begin our analysis, the long history of Penn Station and regional rail transportation is shown in Figure 3-2.
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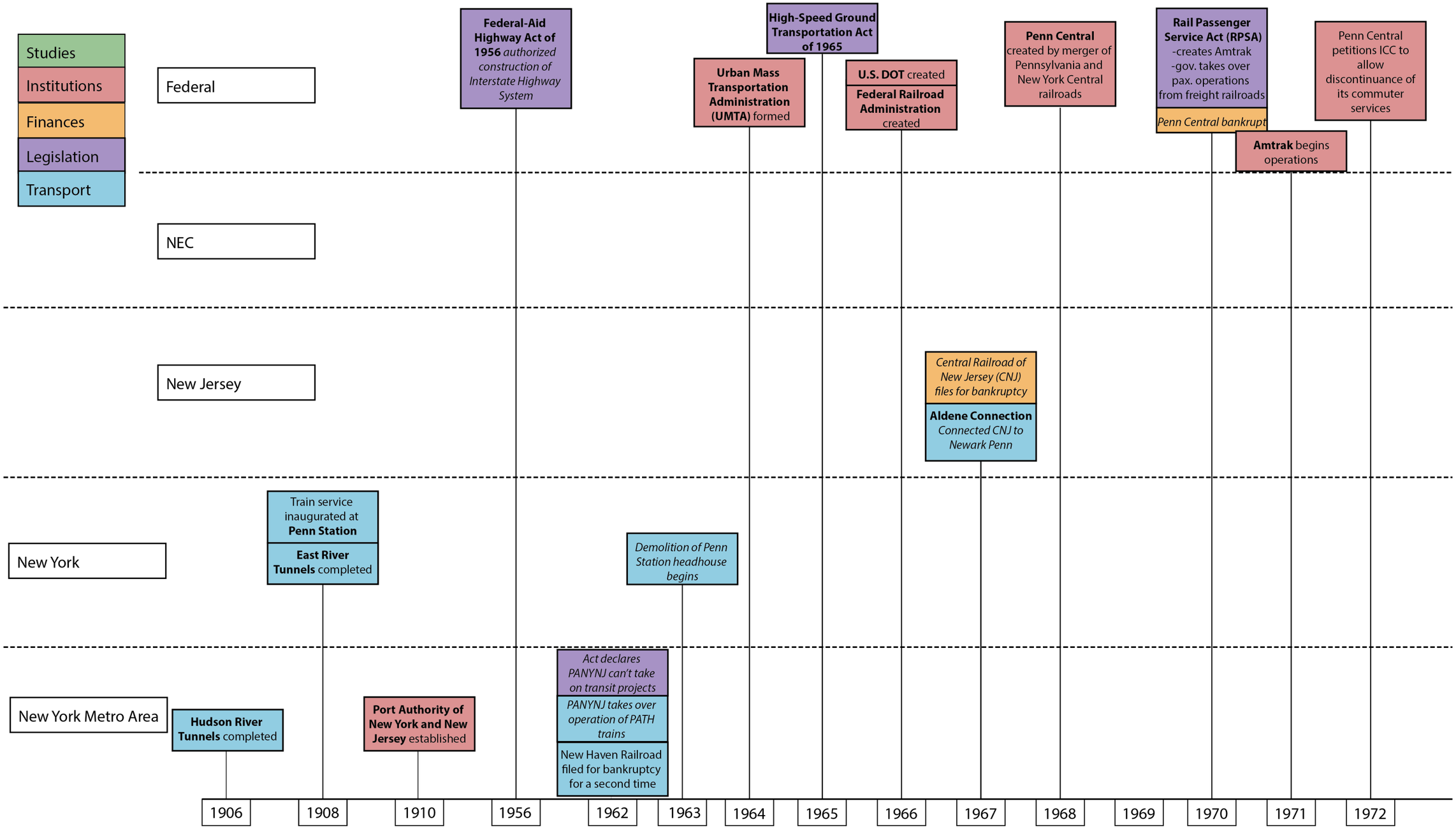
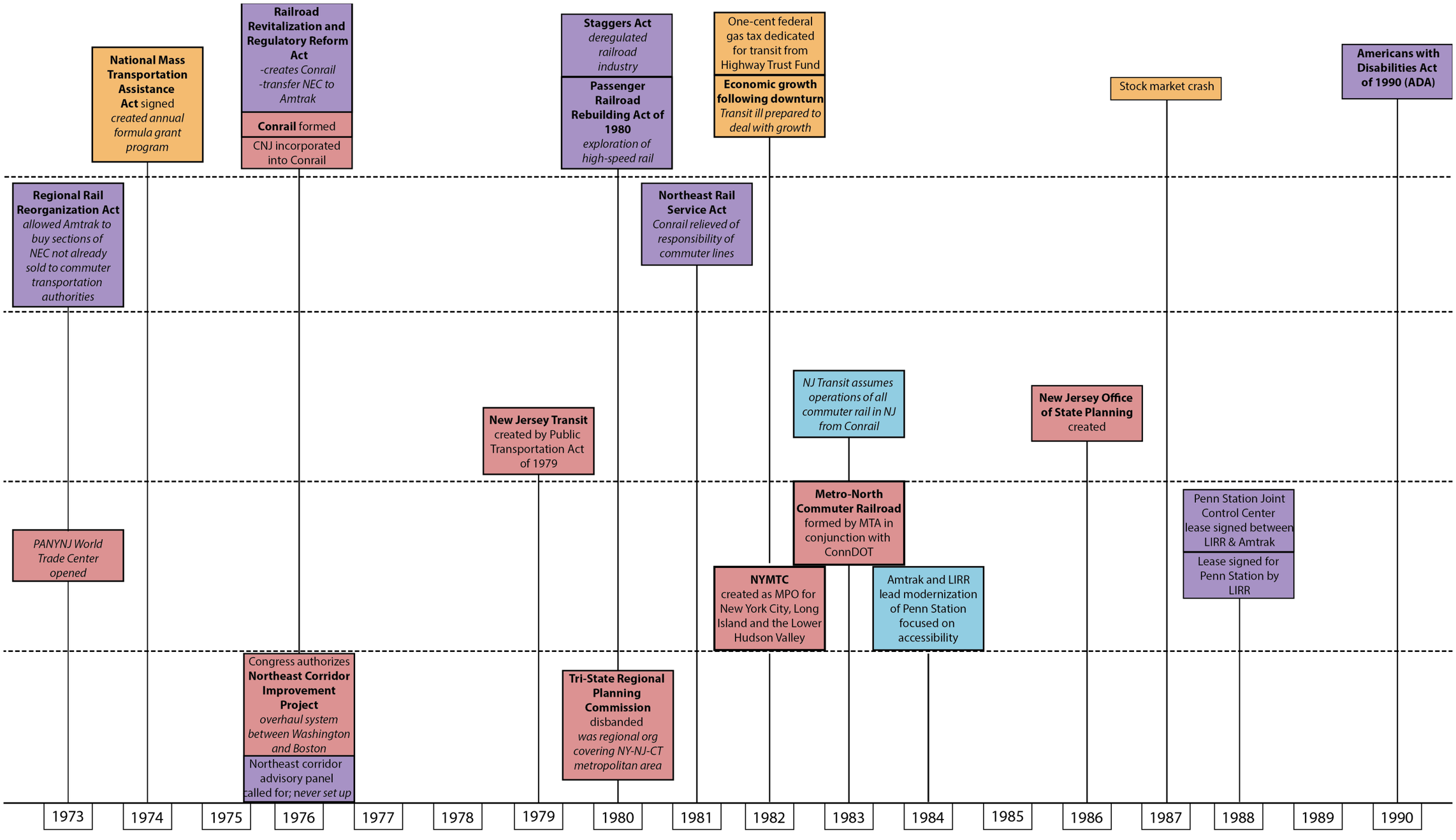


Figure 3-2: The history of Penn Station and regional rail transportation.


Railroad Revitalization and Regulatory Reform Act
-creates Conrail
-transfer NEC to Amtrak
Conrail formed
CNJ incorporated into Conrail
National Mass Transportation Assistance Act signed
created annual formula grant program
Staggers Act
deregulated railroad industry
Passenger Railroad Rebuilding Act of 1980
exploration of high-speed rail
One-cent federal gas tax dedicated for transit from Highway Trust Fund
Economic growth following downturn
Transit ill prepared to deal with growth
Stock market crash
Americans with Disabilities Act of 1990 (ADA)
Regional Rail Reorganization Act
allowed Amtrak to buy sections of NEC not already sold to commuter transportation authorities
Northeast Rail Service Act
Conrail relieved of responsibility of commuter lines
New Jersey Transit
created by Public Transportation Act of 1979
NJ Transit assumes operations of all commuter rail in NJ from Conrail
New Jersey Office of State Planning
created
Metro-North Commuter Railroad
formed by MTA in conjunction with ConnDOT
PANYNJ World Trade Center opened
NYMTC
created as MPO for New York City, Long Island and the Lower Hudson Valley
Amtrak and LIRR lead modernization of Penn Station focused on accessibility
Penn Station Joint Control Center lease signed between LIRR & Amtrak
Lease signed for Penn Station by LIRR
Congress authorizes Northeast Corridor Improvement Project
overhaul system between Washington and Boston
Northeast corridor advisory panel called for; never set up
Tri-State Regional Planning Commission
disbanded
was regional org covering NY-NJ-CT metropolitan area
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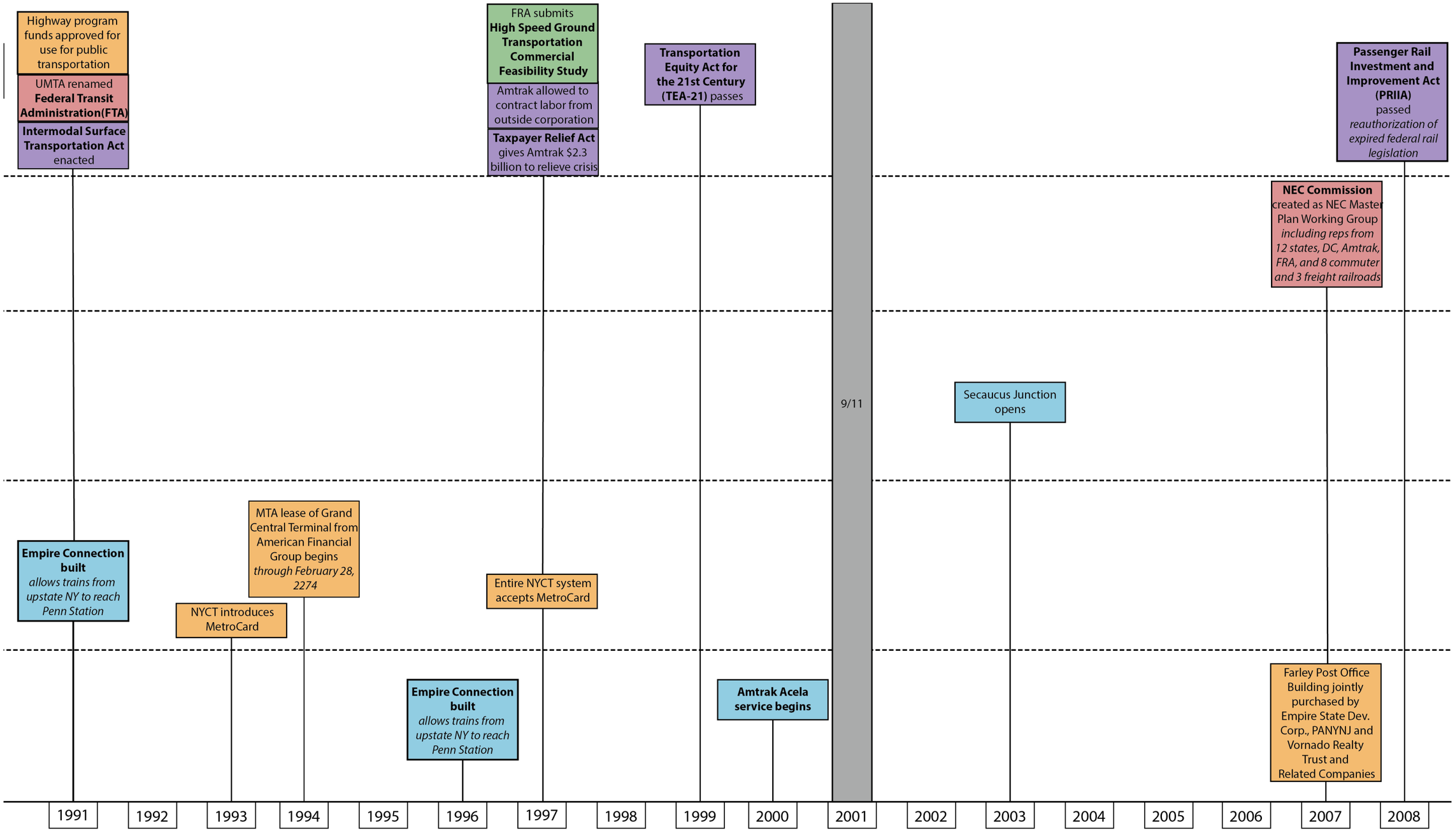
Highway program funds approved for use for public transportation
UMTA renamed **Federal Transit Administration(FTA)**
Intermodal Surface Transportation Act enacted
FRA submits **High Speed Ground Transportation Commercial Feasibility Study**
Amtrak allowed to contract labor from outside corporation
Taxpayer Relief Act gives Amtrak $2.3 billion to relieve crisis
Transportation Equity Act for the 21st Century (TEA-21) passes
9/11
Secaucus Junction opens
Passenger Rail Investment and Improvement Act (PRIIA) passed *reauthorization of expired federal rail legislation*
NEC Commission created as NEC Master Plan Working Group *including reps from 12 states, DC, Amtrak, FRA, and 8 commuter and 3 freight railroads*
Empire Connection built *allows trains from upstate NY to reach Penn Station*
NYCT introduces MetroCard
MTA lease of Grand Central Terminal from American Financial Group begins *through February 28, 2274*
Entire NYCT system accepts MetroCard
Empire Connection built *allows trains from upstate NY to reach Penn Station*
Amtrak Acela service begins
Farley Post Office Building jointly purchased by Empire State Dev. Corp., PANYNJ and Vornado Realty Trust and Related Companies
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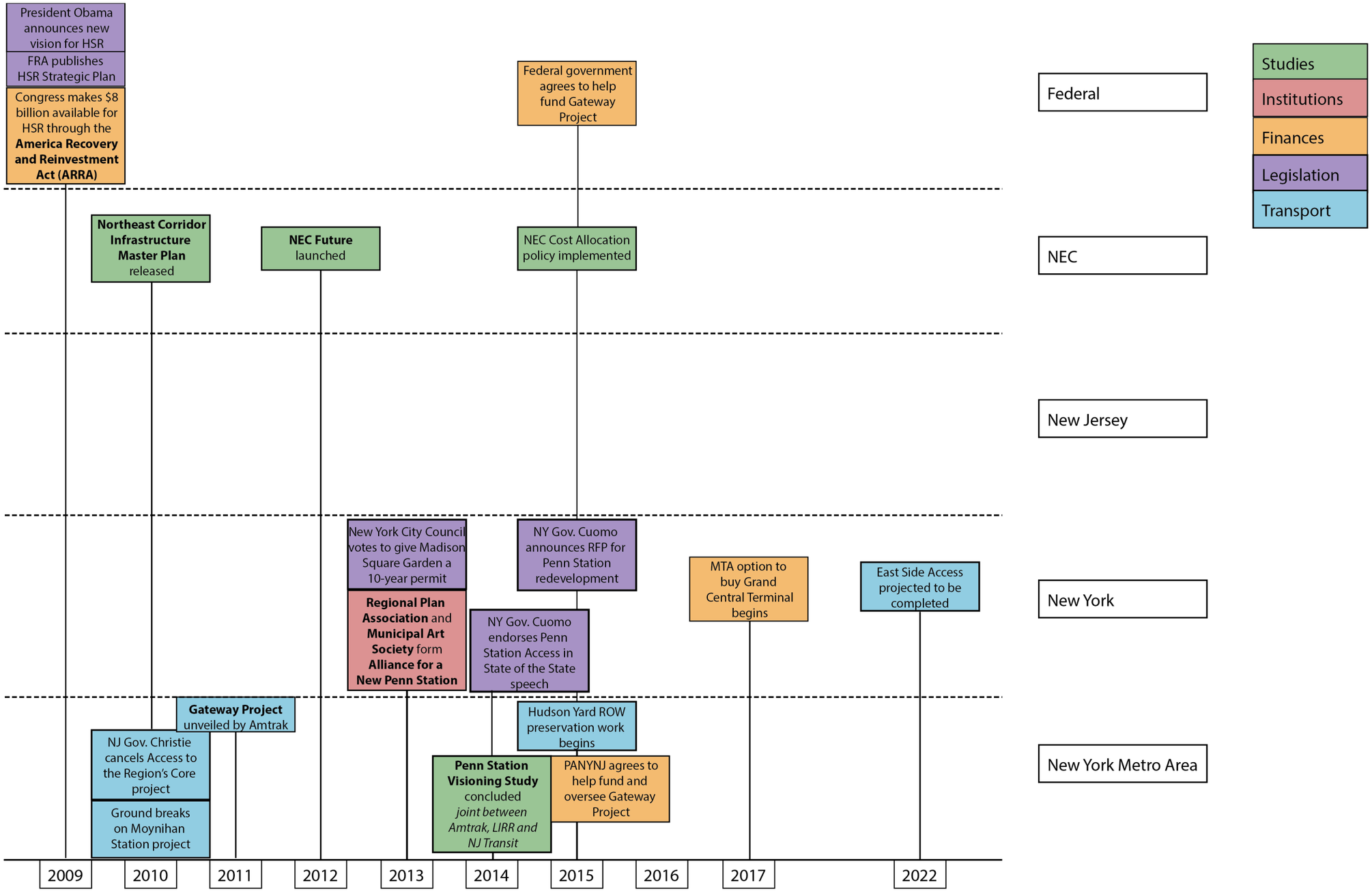
President Obama announces new vision for HSR
FRA publishes HSR Strategic Plan
Congress makes $8 billion available for HSR through the **America Recovery and Reinvestment Act (ARRA)**
Federal government agrees to help fund Gateway Project
Northeast Corridor Infrastructure Master Plan released
NEC Future launched
NEC Cost Allocation policy implemented
New York City Council votes to give Madison Square Garden a 10-year permit
NY Gov. Cuomo announces RFP for Penn Station redevelopment
MTA option to buy Grand Central Terminal begins
East Side Access projected to be completed
Regional Plan Association and **Municipal Art Society** form **Alliance for a New Penn Station**
NY Gov. Cuomo endorses Penn Station Access in State of the State speech
Gateway Project unveiled by Amtrak
Hudson Yard ROW preservation work begins
NJ Gov. Christie cancels Access to the Region's Core project
Penn Station Visioning Study concluded *joint between Amtrak, LIRR and NJ Transit*
PANYNJ agrees to help fund and oversee Gateway Project
Ground breaks on Moynihan Station project
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New York
New York Metro Area
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Finances
Legislation
Transport

3.2 Describing the Institutional Landscape: Key Players in the Region

Transportation planning takes place primarily in the public sector, bringing together actors from across multiple levels of government and other agencies. One of the key complexities of regional rail transport in the New York metropolitan area and the Northeast Corridor is the political and institutional legacy of existing rail ownership and operations, as well as the presence of state borders that divide the region. Each stakeholder has its own mission, objectives and governing rules that may conflict with others along the corridor.

In the case of Penn Station, the primary actors fall into seven subgroups:

1) Federal Government
2) State Governments
3) Regional governance bodies
4) Local and Municipal Governments
5) Rail Operators
6) Non-profits/Civil Society
7) Private Sector

3.2.1 Federal Government

The role of the federal government is to set national policy, as well as provide fiscal and technical assistance to states and local governments. By attaching specific requirements to financial assistance, the federal government has exercised considerable influence over transportation and metropolitan planning processes.

The current structure of federal transportation agencies begins with the creation of the **U.S. Department of Transportation** (DOT) in 1966. The DOT controls ten modes of transportation and is headquartered in Washington, D.C. One of those agencies, the **Federal Transit Administration** (FTA) was created in 1964 by President Lyndon Johnson as the Urban Mass Transportation Administration (UMTA) in order to provide support for mass transit projects.

The Administration was renamed as the FTA[3] in 1991 to reflect the expansion of its reach into rural areas and to include a focus on ensuring mobility for all Americans, including

[3] The FTA was created by Chapter 53 of Title 49 of the U.S. Code. The legislation incorporates the Urban Mass Transportation Act enacted in 1964 and states "it is in the interest of the United States, including its economic interest, to foster the development and revitalization of public transportation systems that (1) maximize the safe, secure, and efficient mobility of individuals; (2)

those with disabilities. The FTA is allocated funding by Congress in short- and long-term transportation legislation, which amend Chapter 53 to modify or set up funding programs and laws for the FTA to follow.

Also under the umbrella of the DOT falls the **Federal Highway Administration** (FHWA) and the **Federal Railroad Administration** (FRA). The FHWA and FRA were created in 1966 by the DOT. The FHWA supports state and local government in the design, construction, and maintenance of the highway system. The FRA implements policy for intercity passenger rail systems in addition to freight rail programs.

Besides direct operation allocations from Congress to Amtrak and from state governments to commuter rail agencies, USDOT and the FRA serve as the second most important source of transportation funding, providing grants for specific infrastructure investment projects and deciding regulations for federal-state partnerships. These agencies are the most closely involved in metropolitan transportation planning. The DOT's mission is to ensure "a fast, safe, efficient, accessible and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future" (USDOT, 2015).

Among federal agencies, the FRA has the most direct control over the NEC. Although in 1985 it transferred management control to Amtrak for all NEC upgrades (as a result of provisions in the *Passenger Railroad Rebuilding Act of 1980*), it is still responsible for distributing funds for NEC upgrades and overseeing its management. The FRA is also responsible for developing and enforcing regulations that pertain to freight and passenger rail transport. For example, the FRA is responsible for developing regulations that pertain to track, signaling, and railcar standards, which would impact the cost of any high-speed rail project. Although the commuter railroads are under the jurisdiction of the FRA, they receive little funding from the administration. The FRA requires and ensures compliance with safety regulations, but commuter railroads work most closely with and receive substantial funding from the FTA.

The FTA provides funding and oversight for mass-transit programs, including commuter rail. There are 19 commuter railroads operating in the United States that receive funding from the FTA, including LIRR, NJR and MNR. The full list of FTA funded railroads is in Section 1.1. The FTA administers programs including the New Starts Program, a federal grant program that supports rail and fixed guideway transport systems. Much of the

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minimize environmental impacts; and (3) minimize transportation-related fuel consumption and reliance on foreign oil."

funding comes from the federal fuel tax. However, funding is limited, and communities are in competition with one another for funding. The two major factors considered when evaluating applications are local financial commitment and project justification. Although the FTA cannot provide funding or regulation for intercity rail transportation, a major component of high-speed rail projects is ensuring appropriate transit connections to and from passenger stations.

Mass transit once fell under the jurisdiction of the **Department of Housing and Urban Development** (HUD), created in 1965, which is also responsible for comprehensive planning in urban areas including housing and land use studies. However, HUD's role in mass transit is now greatly diminished, though it still remains a source of grants for planning. The **Environmental Protection Agency** (EPA) gained a greater role in transportation planning with the passage of the Clean Air Act Amendments in 1990. States which fail to progress towards air quality goals risk losing their transportation funding.

In addition to these federal agencies, **Congress** plays a central role in creating transportation policy. Congress is comprised of the two Houses, committees and subcommittees. Both Houses have appropriation committees responsible for appropriating funds to the aforementioned agencies, and both Houses must approve major program changes or agency restructuring. In the House of Representatives, the majority of transportation-related activities take place within the **Transportation and Infrastructure Committee**, while in the Senate, responsibility for transportation legislation lies primarily with the **Commerce, Science and Transportation Committee**, and the **Banking, Housing and Urban Affairs Committee**. For a bill to make it to the floor of Congress for a vote, all committees with jurisdiction over any part of the bill must approve it. Given the impact of transportation initiatives on the environment, the economy, and communities, a federal HSR initiative in the United States would be reviewed by many of these committees.

Congress controls federal funding for high-speed and passenger rail, which must pass through both houses. Historically, Congress has considered the transportation budget on a year-to-year basis, making it difficult to plan multi-year infrastructure investment due to funding uncertainty. Although leadership from the executive branch of government (the President and his or her cabinet) can influence the chances of a funding bill being approved by Congress, the distribution of political affiliation in both chambers can also have a strong impact on its chances.

The *Fixing America's Surface Transportation (FAST) Act* was signed into law by President Barack Obama in December 2015, authorizing $305 billion in transportation funding over five years, including $9 billion for New York state highways. Transportation has historically

faced stopgap funding, with few long-term funding bills authorized(Sweeney, 2016). The new bill provides:

- *Funding predictability*. The bill is fully funded for five years, giving states a predictable flow of federal money to plan for infrastructure.
- *Increased freight funding*. Freight has become a focus in transportation policy in recent years and the new transportation bill provides funding for freight infrastructure improvements, and establishes a National Highway Freight Program.
- *Acceleration of disruptive technologies*. The new bill provides funding for autonomous vehicle programs and collision-avoidance technologies.

One important piece of legislation that has a particular impact on Penn Station and the Northeast Corridor is *PRIIA 212*. This section of legislation is part of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). PRIIA 2008 created the Northeast Corridor Infrastructure and Operations Advisory Commission. The Commission was created as a platform for collaborative planning and decision-making along the corridor. One important outcome this legislation was the creation of a new cost-sharing arrangement for NEC infrastructure used for commuter and intercity rail services.

3.2.2 State Governments and Agencies

Located at the heart of the NEC, Penn Station is affected not only by the states that operate the commuter systems that run through it, but also by those along the entirety of the corridor. From Boston to Washington, D.C. via New York City, the Northeast Corridor passes through the District of Columbia and nine states: Massachusetts (MA), Rhode Island (RI), Connecticut (CT), New York (NY), New Jersey (NJ), Pennsylvania (PA), Delaware (DE), Maryland (MD) and Virginia (VA). Currently, there are no formal organizations or institutionalized processes that allow states to make collective decisions regarding the NEC, but representatives from each state's Department of Transportation are part of the Northeast Corridor Infrastructure and Operations Advisory Committee, detailed in Table 3-1.

State Departments of Transportation are the key players below the federal level, responsible for the construction, operation and maintenance of highway facilities. Built up during the Interstate Era, state DOTs are often dominated by highway engineers, though in some places they are directly involved in urban transportation planning. Some responsibility was delegated to metropolitan planning organizations, detailed further in section 3.2.3. This was seen as a threat to the states' right of self-determination in some places. Departments of Transportation are seen as necessary in the public interest in order to:

- Ensure coordinated and effective administration of governmental transportation programs
- Make easier the development and improvement of coordinated transportation service provided by private enterprise
- Encourage the cooperation of Federal, State and local governments, carriers, labor and other interested parties
- Stimulate technological advances
- Provide leadership in identifying and solving transportation problems

In addition to state DOTs, **governors** and **state legislatures** enact influence over transportation decisions. On the East Coast of the United States, states play a particularly large role in regional decisions.

3.2.2.1 NEW YORK STATE

New York State has primary political power over Penn Station and its occupants. Its residents make up the most of the ridership into the station, and it is also the most populous state in the region. However, the governor, Andrew Cuomo, faces the challenge of balancing the interests of upstate New York with a very strong pull from New York City. With a population of 8.4 million people, NYC's interests and needs are very different than that of the rest of the state, which is primarily rural in character. 2015 saw this conflict play out with the approval of the MTA 2015-2019 Capital Plan and a subsequent call for equal funding into upstate transportation infrastructure.

There have been significant delays in funding the MTA 2015-2019 Capital Plan, and there have been media accounts of Governor Cuomo's hesitation in claiming the MTA as a state agency (Kabak, 2015). The Governor's position on helping fund transportation in and around New York City is not clear.

Table 3-1: NEC State Government and Congressional Political Party Affiliations, Jan. 2014.

State	Population	Governor	State Senate	State House	Congressional Representatives	Congressional Senators
MA	6.745 million	Deval Patrick, D	D	D	9 – D	2 – D
RI	1.055 million	Lincoln Chafee, D	D	D	2 – D	2 – D
CT	3.597 million	Dannel Malloy, D	D	D	5 – D	2 – D
NY	19.75 million	Andrew Cuomo, D	D	D	21 – D / 6 – R	2 – D
NJ	8.938 million	Chris Christie, R	D	D	5 – D / 6 – R 1 vacancy	2 – D
PA	12.79 million	Tom Corbett, R	R	R	5 – D / 13 – R	1 – D / 1 – R
DE	935,614	Jack Markell, D	D	D	1 – D	2 – D
MD	5.976 million	Martin O'Malley, D	D	D	7 – D / 1 – R	2 – D
VA	8.326 million	Terry McAuliffe, D	Split	R	3 – D / 8 – R	2 – D

3.2.2.1.1 METROPOLITAN TRANSPORTATION AUTHORITY

The **Metropolitan Transportation Authority** (MTA) was chartered by the New York State Legislature, and serves an area in southeastern New York encompassing approximately 14.6 million people, moving more than 8.5 million passengers per day and employing over 60,000 people. The MTA consists of seven agencies, which although part of the same organization, functionally operate as different organizations. These agencies are: *New York City Transit*, running the New York City subway system; *Long Island Rail Road*, running commuter rail to Long Island; *Metro North Railroad*, running commuter rail to the northern suburbs in New York and Connecticut; *Staten Island Railroad*, operating rail on Staten Island; *MTA Bus Company*; *MTA Capital Construction*, in charge of major capital projects; and *MTA Bridges and Tunnels*, which operates seven intrastate toll bridges and two tunnels in NYC.

State interests largely control the MTA board; the Governor directly nominates six members of the 19-member board, including the Chairman and CEO. The New York City mayor recommends four members, and the county executives of Nassau, Suffolk, Westchester, Dutchess, Orange, Rockland, and Putnam counties each recommend one member. The representatives for Dutchess, Orange, Rockland and Putnam counties cast one collective vote. The New York State Senate must confirm all board members. Figure 3-3 shows the 31 counties considered to make up the New York Metropolitan Area, while Table 3-2 details the representation per resident of each county on the MTA Board. Suburban residents have their interests represented on the MTA Board more strongly than residents of New York City, the epicenter of the MTA region.

Much of the MTA's revenues come from roadway tolls on the infrastructure it operates. The State also controls much of the funding for the MTA, but state contributions to the MTA capital programs, according to the Tri-State Transportation Campaign, have dropped to only 8% from a high of 19%. The State is facing major challenges for transportation funding; the gas tax is the primary source of transportation funding in the state, and as vehicles have become more fuel efficient, revenues have dropped.

Given the size of the state, and the need to balance resources throughout, regional cooperation around the city may be lower on the list of state priorities than in other places in the region. However, New York City accounts for the majority of the economy in both New York and New Jersey. If the city were a country, it would be ranked 10th in terms of gross product (Global Insight, 2006).

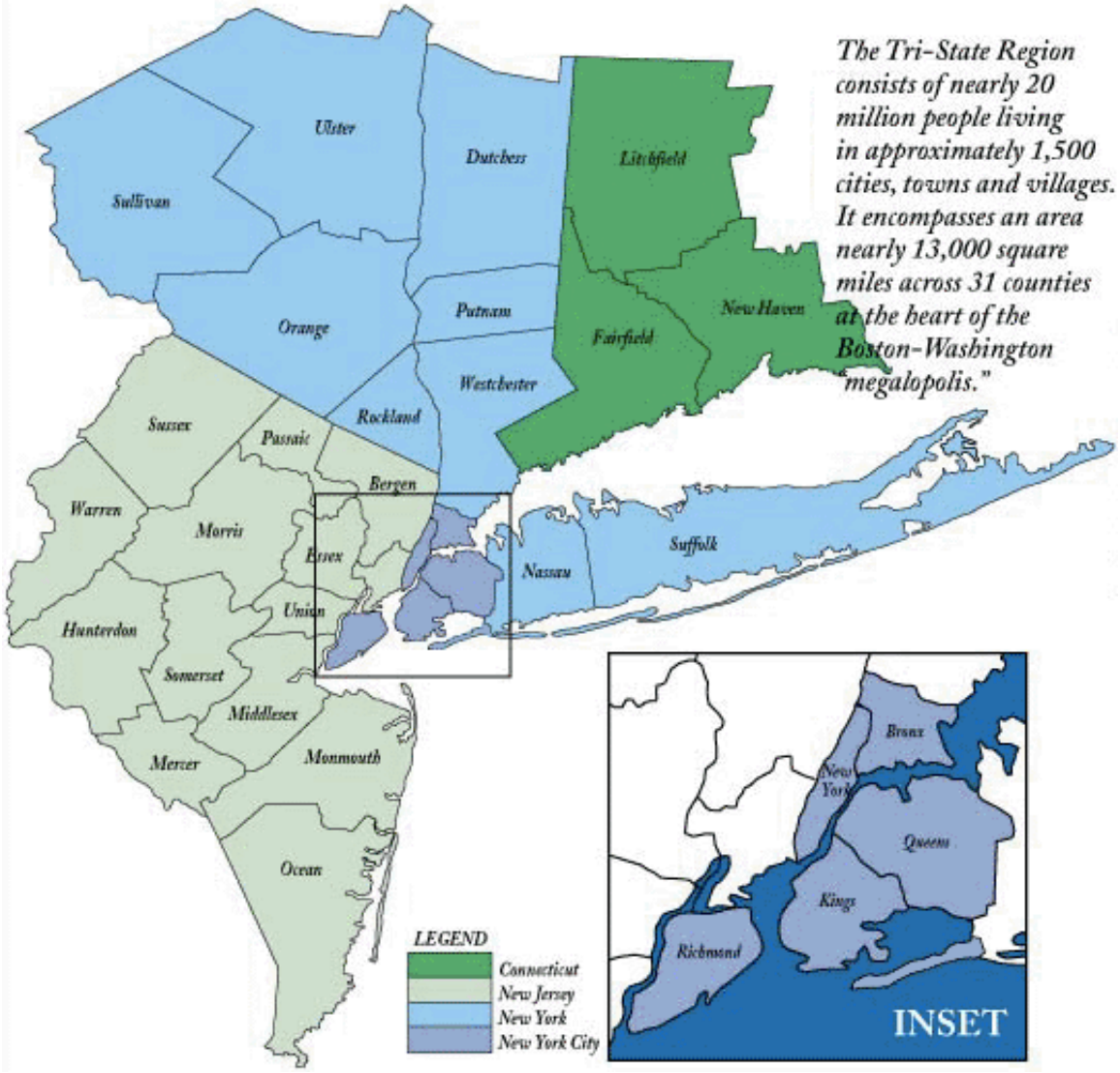

Figure 3-3: The 31 counties that make up the New York City metropolitan region (U.S. Global Change Research Program, 2000)

Table 3-2: Member Counties of the MTA Board and Relevant Statistics

County	Population (million)	Commuters to NYC	Millions of persons/ vote
Nassau	1.35	95,332 (NY county) 70,433 (Queens county) 25,255 (Kings County) 902 (Richmond)	1.35
Suffolk	1.5	10,248 (Kings) 40,320 (NY) 25,052 (Queens) 691 (Richmond)	1.5
Westchester	0.97	3,818 (kings) 82,796 (NY) 5,452 (Queens) 115 (Richmond)	0.97
Dutchess	0.30	401 (Kings) 5,484 (NY) 551 (Queens) 26 (Richmond)	1.2
Orange	0.38	1,441 (Kings) 10,971 (NY) 1,230 (Queens) 123 (Richmond)	1.52
Rockland	0.32	1,501 (Kings) 14,894 (NY) 1,525 (Queens) 171 (Richmond)	1.28
Putnam	0.10	297 (Kings) 4,186 (NY) 315 (Queens) 21(Richmond)	0.4
Total	4.92		1.23
Kings	2.57		3.21
Queens	2.27		2.84
Richmond	0.47		0.59
Bronx	1.41		1.76
New York	1.62		2.03
Total	8.34		2.09*

*removing Richmond County (Staten Island) increases this number to 2.46 million persons per vote

3.2.2.1.2 NEW YORK STATE DEPARTMENT OF TRANSPORTATION

The **New York State Department Of Transportation** (NYSDOT) is in charge of coordinating and developing comprehensive transportation policy for the state of New York, coordinating and assisting in the development and operation of transportation facilities and services in the state, including highways, railroads, public transportation systems, ports, waterways and aviation facilities, and keeping a current long-range statewide transportation master plan that balances the development of public and private transportation facilities. The DOT is also in charge of public safety with regards to transportation facilities and provides oversight to bus, commuter rail and subway systems that are publicly subsidized through the Public Transportation Safety Board. The DOT currently has 8,300 employees and an annual capital program of $3.7 billion. The Commissioner is Matthew Driscoll, appointed on July 2, 2015 by Governor Andrew Cuomo.

The NYSDOT was created in its current form in 1967 to manage the state's transportation system and the need to coordinate the development of infrastructure among modes. However, its history dates back to 1777 and the creation of the Office of Surveyor-General, in charge of surveying preceding the building of the Erie Canal. In 1907 the Department of Public Works was established to take responsibility for the economic and safety regulation of privately operated transportation, railroad and bus safety inspections, and to provide approval for the installation of protection for or elimination of at-grade rail highway crossings. The Highway Act established the New York State Department of Highways in 1909, and in 1923 the Department of Public Works assumed responsibility for highways, canals and public buildings.

Today, the NYSDOT is made up of 11 regions. Region 11, which encompasses New York City, is by far the most populous with 8.2 million residents. Table 3-3 shows the NYSDOT regions and 2010 populations and Figure 3-4 shows the location of the regional offices.

Table 3-3: New York State Department of Transportation Regions and 2010 Population

Region	Population
1	1,055,481
2	483,425
3	855,312
4	1,156,557
5	1,350,731
6	280,457
7	388,987
8	2,276,400
9	522,737
10	2,832,882
11	8,175,133

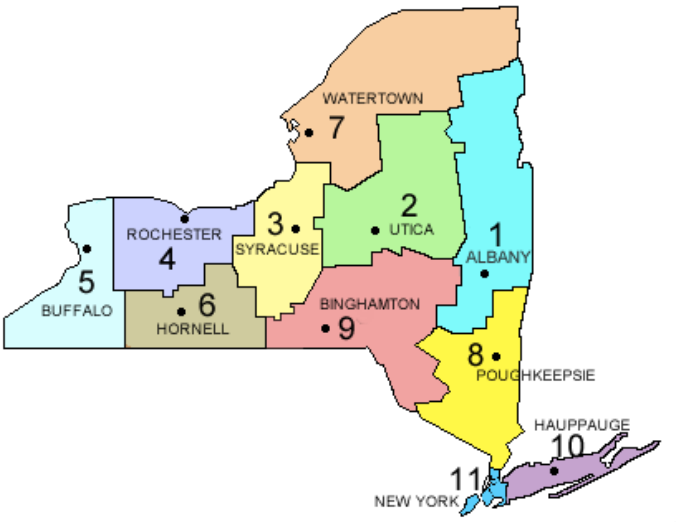

Figure 3-4: New York State Department of Transportation Regional offices (NYSDOT, 2015)

3.2.2.1.3 New York Design and Construction Corporation

Governor Cuomo announced in April 2016 a new state agency that will have a non-binding advisory role for public construction projects worth more than $50 million (Tangel, 2016c). The Design and Construction Corp. will be part of the State's Dormitory Authority, known for financing the construction of health-care and university buildings.

The agency was initially proposed in February 2016 with the proposal to have unlimited eminent domain powers and the ability to void existing state contracts (Campbell, 2016). While it seems that the new corporation will not have these powers, there is uncertainty

regarding the oversight, influence and added bureaucracy that this new authority will have over major public works projects, particularly those of the MTA.

3.2.2.2 NEW JERSEY

In many ways New Jersey, particularly northern New Jersey, lives in the shadow of New York City. Many of its residents work in the city, and its proximity is a draw for many businesses to locate in New Jersey as well, gaining the benefits of proximity but with lower rents. The Governor of New Jersey is considered to hold significant power not only within the region, but also within the country. Chris Christie, serving since January 19, 2010, has tremendous influence in New Jersey, and has halted spending to avoid creating deficits. This has put him at odds with unions and public workers over pension and benefit issues. He has also been criticized numerous times for decisions and scandals including the cancellation of the Access to the Region's Core project, as well as George Washington Bridge lane closures in 2013. Christie also has proved very successful in fundraising for his political campaigns.

The Transportation Capital Program for FY 2016 totals $4.984 billion, funded primarily by the State Transportation Trust Fund, federal and third-party funding. This amount include $4.034 billion for NJDOT and NJ Transit projects, and $950 million for Port Authority projects. State funds are projected to be $1.6 billion; this includes $1.096 billion for NJDOT made up of $743.5 million from the Transportation Trust Fund (TTF) and $353 million from PANYNJ. The remainder includes $503.5 million from the TTF for NJ Transit ("Transportation Capital Program FY 2016," 2015).

The **State Transportation Trust Fund** is administered by an independent agency of the New Jersey state government, the **New Jersey Transportation Trust Fund Authority**, whose mission is "to finance the cost of planning, acquisition, engineering, construction, reconstruction, repair, resurfacing, and rehabilitation of the state's transportation system" ("New Jersey Transportation Trust Fund Authority - Overview," 2016). The Authority was created in 1984 by the Transportation Trust Fund statute (NJSA 27:1B et al.) in order to provide a stable and predictable funding source for transportation system improvements in New Jersey. In November 2006 an amendment was made to dedicate all 10.5 cents of the existing motor fuel tax for transportation capital improvement purposes.

3.2.2.2.1 NEW JERSEY TRANSIT

New Jersey Transit runs rail, bus and light-rail service across the state of New Jersey. NJ Transit is the third largest public transit provider by ridership in the country and links points across New Jersey, New York and Philadelphia. The organization was created by the Public Transportation Act of 1979 in order to "acquire, operate and contract for

transportation service in the public interest" ("New Jersey Transit," 2016). NJ Transit purchased Transport of New Jersey in 1980, the largest private bus operator in the U.S. at the time, and incorporated other private bus companies into NJ Transit Bus Operations between 1981 and 1985. NJ Transit Rail Operations was launched as a subsidiary on January 1, 1983 to take over operations of commuter rail within the state after Congress ordered Consolidated Rail Corporation (Conrail) to cease its passenger operations.

An eight member Board of Directors oversees NJ Transit. The Governor appoints all members; seven members are voting members, four of whom are from the general public and three are State officials. The labor organization representing the plurality of employees recommends one non-voting member. The Governor can override the board's decisions by vetoing the board's meeting minutes. The Board selects an Executive Director to administer the entire agency.

NJ Transit is the most intensive user of the NEC in terms of train miles, but lacks control of much of the infrastructure. They have the fastest growing ridership out of any of the transportation systems using Penn Station, but, due to the limited capacity under the Hudson, cannot grow much more. NJ Transit has said very publicly that the customer comes first. There is significant concern about the ability to grow capacity into New York City.

Penn Station is an important issue for NJ Transit; currently eighty percent of NJ Transit journey-to-work trips are into the Manhattan CBD between 6am and 6pm. NJ Transit controls very little of their own decision-making at Penn Station in terms of capacity allocation on the tracks and at the station due to lease agreements with Amtrak.

Governor Christie controversially cancelled the Access to the Region's Core project in 2010 that would have added additionally capacity for New Jersey Transit trains into a station south of Penn Station. Although some experts argue that the project was problematic to begin with because it would not have added redundancy for the existing tunnels into Penn Station, and would have only been accessible for New Jersey Transit trains. By cancelling the project, Christie asserted his power over the state of transportation affairs into NYC. Governor Christie has also yielded influence over NJ Transit's ability to be involved in the Gateway Project. The agency was not involved in the first step of the Moynihan Station/Penn Station project, the West End concourse platform extension to create additional vertical access points to the platforms, due to Governor Christie uncertainty regarding the position of New Jersey on the Gateway Program. There is currently uncertainty regarding the financial status of NJ Transit and the agency cannot commit to financial outlays for the Gateway Program.

3.2.2.2.2 New Jersey Department of Transportation

The **New Jersey Department of Transportation** is responsible for the maintenance and operation of the highway and public road system, as well as developing transportation policy and working with other actors on passenger and freight rail issues. NJDOT was responsible for passenger rail in New Jersey until 1979.

The mission of NJ DOT is "improving lives by improving transportation" ("NJDOT Mission Statement," 2014). The department's core mission revolves around safety, infrastructure preservation and mobility, reflected in the Transportation Capital Program.

3.2.2.3 Connecticut

The State of Connecticut, with a smaller population and less political sway, has less say over the state of affairs at Penn Station. Additionally, the state does not run the regional rail that comes through the state, but rather the MTA is responsible for a number of routes into Connecticut. Historically, the Connecticut state government has been more willing to cooperate regionally, but has little convening power among other state actors.

3.2.2.3.1 Connecticut Department of Transportation

The **Connecticut Department of Transportation** is responsible for highways, railroads, mass transit systems, ports, waterways and aviation facilities in Connecticut. The CTDOT oversees Metro-North's operation of the New Haven Mainline, as well as funding for Amtrak's Shore Line East system.

3.2.3 Regional Agencies

Regional governance has long been the weakest form of government within the federal system. Due to the strong power that states hold, regions that cut across state boundaries face particular challenges. **Metropolitan Planning Organizations** (MPOs) were established in the mid-1970s through joint action on highway and transit planning issues by the FHWA and the Urban Mass Transit Administration, the predecessor to the FTA. MPOs are generally advisory, not governmental, bodies. The ultimate role of MPOs is a state and local decision, but few are empowered by state constitutions with independent fiscal powers or directly elected boards. Federal transportation law requires that "urbanized areas with populations of 50,000 or more have MPOs to establish a regional long-range transportation plan (LRP) and a near-term transportation improvement plan (TIP)" (G.-C. Sciara & Wachs, 2007). Gage called MPOs "twilight-zone agencies" without a constitutional or legal place within the American federal system of government. MPOs are responsible for planning, requesting, and allocating federal funding (NJTRANSIT & NJDOT, 2015).

MPOs have the power to:

- Develop, adopt and endorse plans

- Approve budgets for regional priority projects known as Transportation Improvement Programs (TIP)
- Approve agreements
- Adopt rules
- Oversee operating procedures
- Choose Climate Mitigation and Air Quality (CMAQ) and Surface Transportation Program (STP) projects
- Create special programs, if funding is found (likely from CMAQ or STP)

MPOs cannot, however, take on many of the general governmental powers including:

- Implementing taxes or raising revenue
- Implement or build projects
- Provide or manage transit services
- Regulate land use

MPOs lack significant decision-making power, but ISTEA, enacted in 1991, did increase their level of responsibility. Transportation laws including ISTEA and TEA-21 allowed large metropolitan areas to more directly control the expenditure of certain types of federal transportation funds. MPOs direct only a small piece of federal transportation funding, between 5-10% depending on the region, and their funding is greatly affected by a specific state's fund allocation process (G. C. Sciara, 2012).

Previous research on MPOs found that they are most commonly characterized by limited partnerships between member governments and agencies (Goldman & Deakin, 2000). (G.-C. Sciara & Wachs, 2007) suggest that increasing the availability of MPO directed funds and revenues may have the ability to enhance collaborative MPO decision-making. Governments that have used retail sales tax measures to support transportation generally do so outside of the established MPO planning process.

3.2.3.1 NEW YORK METROPOLITAN TRANSPORTATION COUNCIL (NYMTC)

NYMTC is a regional MPO responsible for New York City, Long Island and the lower Hudson Valley. The organization is responsible for developing regional plans, making decisions on the use of federal transportation funds and providing a forum for collaborative planning in the region. It was created in 1982 after an MPO for the states of New York, New Jersey and Connecticut, the **Tri-State Regional Planning Commission**, was disbanded due to disagreement among power-sharing. Unlike many other MPOs in the United States, the staff of NYMTC are employees of the New York State DOT.

The New York Metropolitan Transportation Council is the MPO for New York City, Long Island and the lower Hudson Valley, consisting of Putnam, Rockland and Westchester counties. Anecdotally, NYMTC has very little power over regional decision-making. Other agencies rely on their travel demand-forecasting model for the New York Metropolitan Area, but they are involved in few decisions.

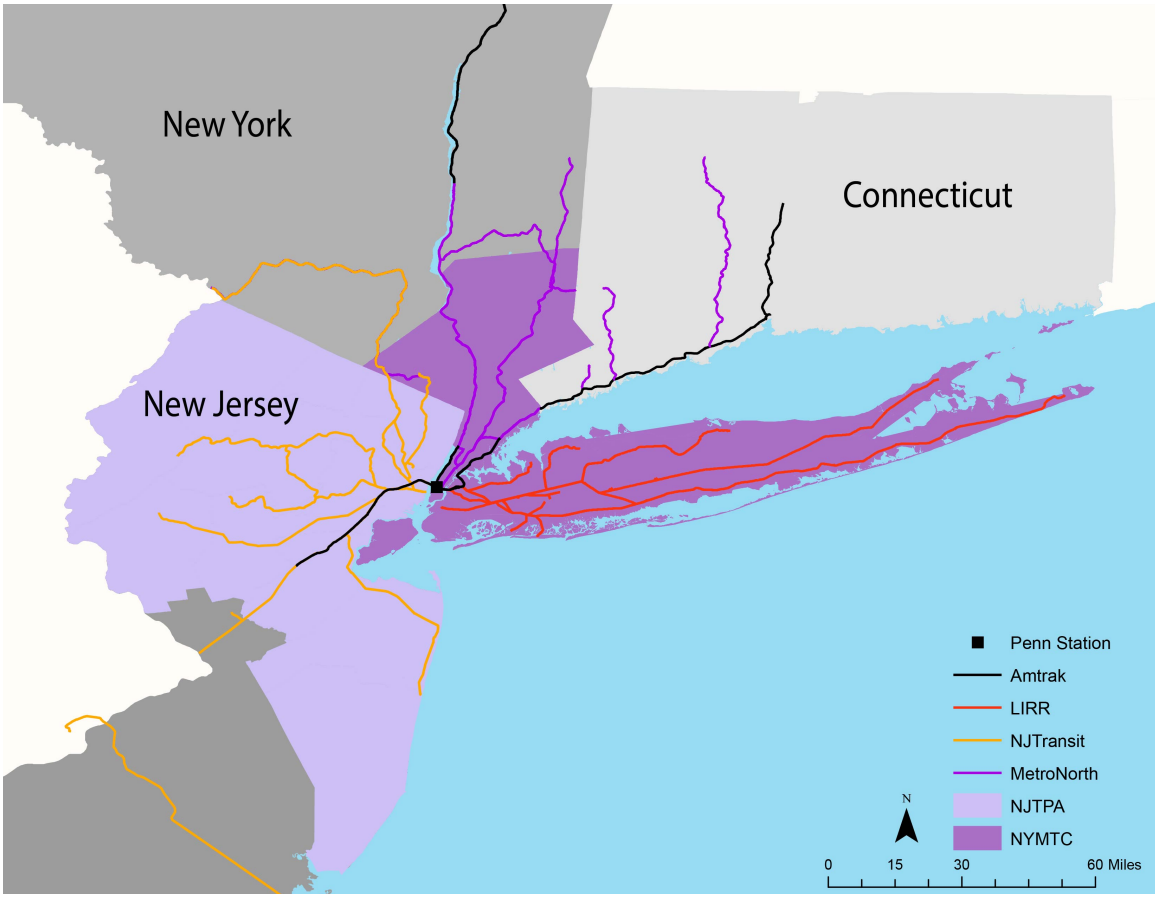

Figure 3-5: Map of New York metropolitan region showing the boundaries of NYMTC (dark purple) and NJTPA (light purple)

3.2.3.2 North Jersey Transportation Planning Authority (NJTPA)

The **NJTPA** is the MPO for 13 counties in the northern New Jersey region, and is one of three MPOs in the state. The role of the NJTPA is to conduct transportation studies and assist local planning agencies with projects, as well as distribute federal transportation funds. The NJTPA also updates its long-range transportation plan every four years in order to provide a guide for the next 25 years of transportation investment.

The agency has an annual budget of about $2 billion to conduct studies, assist local planning agencies, and help distribute federal funding to local subregions. The Authority works with its 15 subregions as well as NJDOT, NJ TRANSIT, the New Jersey Governor and the Port Authority to carry out regional transportation planning work. NJTPA is guided by a long-term plan updated every four years. The NJTPA board, similar to that of NYMTC, is

made up of representatives from other organizations. These members represent their organizational views, not regional views.

3.2.3.3 THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY (PANYNJ)

The PANYNJ was created in 1921 and is a joint venture agreement between New York and New Jersey. It was established through an interstate compact authorized by the U.S. Congress. The PANYNJ was the first bi-state agency created under a constitutional clause that permits interstate compacts (agreements) with congressional approval. It was created in order to undertake port and regional improvements that were not likely to be financed by private enterprises, nor be attempted by either state alone. Figure 3-6 shows the jurisdiction of the PANYNJ.

Figure 3-6: An overview of the PANYNJ port district with facilities highlighted (Port Authority of New York and New Jersey, 2016).

The PANYNJ "conceives, builds, operates and maintains infrastructure critical to the New York/New Jersey region's trade and transportation network" (Port Authority of New York and New Jersey, 2016). Today the PANYNJ oversees the port, as well as tunnel, and bridge

connections, and one rail connection, between the states as well as trade and transportation projects that contribute to the region's economy. PANYNJ was severely impacted by the events of September 11, 2001. The World Trade Center towers were owned by PANYNJ and 84 employees of PANYNJ were lost in the attacks.

The Authority is a financially self-supporting entity that does not receive any tax revenue from either New York or New Jersey, nor from any local jurisdiction. It has no power to tax and Congress mandated that there would be no tariffs or fees imposed by the Authority. The Authority relies on revenue generated from tolled facilities including its bridges and tunnels, as well as user fees from its airports and bus tunnels, fares on the PATH system and rent from its facilities, consumer services and retail stores. The PANYNJ controls facilities spanning aviation, tunnels, bridges, bus terminals, port terminals, rail and real estate. A complete list is shown in Table 3-4.

Table 3-4: Port Authority Assets (Port Authority of New York and New Jersey, 2016)

Aviation	**Tunnels and Bridges**
John F. Kennedy International Airport, NY LaGuardia Airport, NY Newark Liberty International Airport, NJ Stewart International Airport, NY Teterboro Airport, NJ	Bayonne Bridge, NY/NJ Goethals Bridge, NY/NJ George Washington Bridge, NY/NJ Holland Tunnel, NY/NJ Lincoln Tunnel, NY/NJ Outerbridge Crossing, NY/NJ
Bus Terminals	**Ports**
Port Authority Bus Terminal, NY George Washington Bridge Bus Station, NY Journal Square Transportation Center, NJ	Port Jersey Port Authority Marine Terminal, NJ Brooklyn Port Authority Marine Terminal, NJ Elizabeth Port Authority Marine Terminal, NJ Howland Hook Marine Terminal, NY Port Newark, NJ
Rail	**Real Estate**
Journal Square Transportation Center, NJ PATH Rail Transit System, NY/NJ	Bathgate Industrial Park, NY Ferry Transportation, NY/NJ Industrial Park at Elizabeth, NJ The Teleport, NY Waterfront Development, NY/NJ Queens West Waterfront Development, NY The South Waterfront at Hoboken, NJ The World Trade Center, NY

The PANYNJ has little experience with rail outside of the PATH train. They have no internal staff knowledgeable of commuter rail, which has different complexities than PATH. The PANYNJ takeover of the PATH train was an important breakthrough for the region in 1962

and in providing a secondary connection from New Jersey to New York. It was a politically forced situation with many complicated legal issue. The 1962 decision also noted that the PANYNJ cannot take on other transit projects; rail projects were viewed as money-losing ventures. This complicates the PANYNJ's involvement at Penn Station, where they have not historically been significantly involved. The PANYNJ would have to go before the state legislatures of both New Jersey and New York in order to get any further rail or transit involvement approved.

In December 2015 it was announced that the PANYNJ would take a lead role on the Gateway Project to build a new rail tunnel from New Jersey into Manhattan in order to provide redundancy to the existing 105-year-old two-track tunnel. The PANYNJ had been a partner with NJ Transit on the ARC project, and the PANYNJ agreed to create a development corporation ("Gateway Development Corporation") to lead construction on the Gateway project. The board of the new Gateway Development Corporation will be comprised of PANYNJ board members from both states, as well as representatives from the U.S. DOT and Amtrak. The corporation is expected to work closely with New Jersey Transit (Port Authority of New York and New Jersey, 2015).

3.2.3.4 THE NORTHEAST CORRIDOR COMMISSION (NEC COMMISSION)

The Northeast Corridor Infrastructure and Operations Advisory Commission was established by Section 212 of PRIIA 2008 to create a new forum for collaborative planning and decision-making for the Northeast Corridor. The Commission was initially charged to create a cost-sharing agreement for NEC infrastructure used for commuter and intercity rail services.

The Commission consists of one member from each of the NEC states (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, and Maryland) and Washington DC; four members from Amtrak; and five members from the US Department of Transportation (USDOT). These members have voting rights. Non-voting representatives are also included from the freight railroads operating on the NEC, states with feeder corridors to the NEC, and commuter authorities not directly represented by a Commission member.

The cost-sharing agreement includes a formula charge for the normalized replacement of capital assets to prevent the Corridor from deteriorating further. In the past, infrastructure owners individually negotiated access and service agreements with users. A standardized formula was desired to streamline business practices between parties. For cost allocation, the NEC was divided into geographic segments. Station operations are included in these costs. Components of station operations excluded from cost sharing include baggage

handling, ticket sales and recaps because they solely benefit an individual operator. Included common-benefit costs are users, security and policing, station operations, utilities and station maintenance.

The new agreement was designed so that all service providers cover the costs of their respective uses of NEC infrastructure, including replacing capital assets in order to prevent further deterioration. The greatest impact at Penn Station is for Long Island Railroad and New Jersey Transit. Amtrak owns Penn Station, and each railroad has historically had a separate contract with Amtrak based on internal negotiations. The legislation also notes that "a new set of relationships [are] required to successfully manage, stabilize, and improve the NEC", that "must be built on trust and partnership – grounded in collaboration, transparency, and a commitment to establishing new governance and investment practices in the public interest".

3.2.4 Local and Municipal Governments and Agencies

3.2.4.1 City of New York

The City of New York has a vested interest in continued regional transportation, but its primary focus is on urban residents, as well as urban transportation. However, the City's contributions to the MTA's operating budget have not kept pace with inflation.

Despite a desired focus on urban residents, the taxes collected from businesses and regional residents working in the city are very important sources of revenues. Facilitating easy access for workers into the city, opening up new business districts within city limits and working to keep business in the City are very important.

Many arguments have ben made that the city should take control of the MTA, but the system relies heavily on state subsidies in order to function, and it is unlikely that the city would be able to fund a system of its size on its own. However, there is little popular understanding of how the MTA is funded and organized, and thus the city often gets blamed for problems when in fact, the city or mayor has no control. This was most evident during Hurricane Sandy and during the anticipated snowstorm in January 2015, when the governor made the decision to shutdown the subway system without first informing the mayor nor the president of the MTA.

3.2.4.2 Borough Governments

New York City is comprised of five boroughs. Each borough is represented by a borough president, but the borough president has few formal powers and there is no legislative functions within a borough. The power of borough presidents lies in real estate and development. They are influential in bringing development to the boroughs and their advisory role to the City Council has the power to influence final decisions. Additionally,

the city allocates 5 percent of its capital budget to the borough presidents to spend, which is oftentimes spent on cultural and educational facilities.
Regional transportation services have traditionally bypassed much of the boroughs that make up the City of New York. Commuter rail, in particular, occupies space within the boroughs (Queens, Brooklyn and the Bronx), but does not provide regular or coordinated service (particularly in terms of fares) to local residents. Commuter rail service within the boroughs does not operate as rapid transit, and thus does not yet supplement the transit access within the boroughs. Additionally, limited stops within the boroughs also means that there is less potential benefit from business opportunities and development around regional transportation access.

Borough presidents consult with the mayor in the preparation of the annual executive budget, make recommendations on budget priorities and capital projects, to review land-use decisions and proposed sites for city facilities, to monitor the delivery of city service and the performance of contracts; and to have legislation introduced to the City Council. Within the City of New York, the executive functions in NYC are handled within the Mayor's Office, and the City Council handles legislative functions.

One example of potential influence of borough presidents is the possible extension of Metro North into the Bronx. As part of the 2015-2019 MTA Capital Plan, there are plans to bring MNR service into Penn Station through the Bronx. Part of this plan entails the development of four new MNR stations in underserved areas of the Bronx. The role of these stations in creating both transit access but also business opportunities in the area remains to be seen. The borough president may be able to influence the final decision about the project, or about development that may come because of it.

3.2.4.3 WESTCHESTER COUNTY

Westchester County is a more affluent suburban county to the north of the Bronx. It is home to many business headquarters, including IBM. Westchester County represents possible opportunities for reverse commuting out of the city on Metro-North. It also presents an opportunity to evaluate the connections between commuter rail and urban rail outside of the city at local stations, as well as connections and relationships between commuter rail agencies.

Westchester County has had a contentious history with equality and equity, particularly in housing. The county has battled with the Department of Housing and Urban Development over the building of affordable housing, and the removal of barriers to fair housing in many of the counties villages and towns (The Editorial Board, 2015).

3.2.4.4 NYC DEPARTMENT OF CITY PLANNING

The NYC Department of City Planning is responsible for physical and socioeconomic planning in the city of New York, covering land use and environmental review, the preparation of plans and policies and advising the Mayor, Borough Presidents, the City Council and other government bodies on urban development.

The role of land use in enabling the use of regional rail remains open. There is opportunity not only to enable the development of parcels around urban terminals, but also to enable residential and commercial development at intermediate stations, as well as at suburban terminals, possibly equalizing demand along the corridor.

The DCP's main power comes from control over zoning. By mandating what developers can and cannot do, the DCP has tremendous power to influence quality of life and the lived experience in the city. The City Planning Commissioner under Michael Bloomberg, Amanda Burden, used zoning as a tool to focus on the experience of the city at the street level and to improve the quality of life.

3.2.4.5 NYC DEPARTMENT OF TRANSPORTATION

The NYC Department of Transportation is responsible for streets, highways, bridges, sidewalks and bus stops within the city of New York. They are responsible not only for the day-to-day maintenance of this infrastructure, but also many transportation safety issues, particularly pedestrian and bicycle safety. The focus on pedestrian and bicycle safety became a prominent issue under Mayor DeBlasio with a focus on 'Vision Zero', working towards zero pedestrian deaths from vehicles in New York.

Ridership at Penn Station and its relationship to the streets directly impacts and is impacted by the NYCDOT. Connections to local employers and businesses around the station are impacted by DOT decisions.

3.2.5 RAIL OPERATORS

3.2.5.1 AMTRAK

While being required to provide service across the country, the Northeast Corridor is the Corporation's only profitable line, serving 11.6 million passengers in 2014. The Acela route is growing in demand, with 28 days in 2014 topping 14,000 passengers, compared to only five days in 2013 (Amtrak, 2014). Amtrak is mandated by federal law to continue operating on routes "that meet political needs but not market demand" (Vranich, 1997). Specifically, the Rail Passenger Service Act of 1970 (RPSA) laid out the routes Amtrak is required to run. According to Amtrak officials, the priorities in the NEC are firstly maintenance, followed by the completion of Moynihan Station, the new Gateway Tunnels, the East Side Access project and keeping the East River Tunnels in good repair.

There are many alternative modes available in the Northeast Corridor, including plane, private automobile and coach bus. Train tickets are often comparable in price to plane tickets, and given the short distance of the corridor, the travel times for these modes (including access and egress times from stations), is likely similar. In 2008, rail had 50 percent of the air-rail market between Boston and New York City (ACRP, 2010). Intercity rail travel in the US is split nearly evenly between business and leisure travel, with 50.9 percent of trips taken for business purposes and 49.1 taken for leisure (NHTS, 2009). However, the price point of rail travel, particularly for leisure travelers, may make the NEC a less attractive option, particularly for travellers traveling last minute. High-speed rail in the NEC may provide a more noteworthy experience for riders, something Amtrak is already addressing by moving its operations to the new Moynihan Station, but is also likely to increase ticket prices.

Amtrak has a decentralized management structure; mechanical and engineering operations for the Northeast Corridor are run out of Philadelphia, and the railroad is headquartered in Washington, D.C. Penn Station is Amtrak's busiest station in terms of boardings and alightings, and there is a superintendent of Penn Station and a deputy general manager who manages train and engine crews, station crews and controls Amtrak operations in New York. Generally, the management of unique events, disruptions or emergencies is handled more effectively than day-to-day operations, according to one former Amtrak manager.

There are only one to two people in charge of deciding train priority at Penn Station. There remains a question of who signs off in an emergency and who is empowered to lead a discussion on making hard decisions; having a dialogue before making changes is important. Scheduling is separate from the deputy general manager, who manages staff who interface with passenger operations. Scheduling consults with deputy general managers, but they are separate entities.

Since 2003, grants to Amtrak are requested annually both by the administration through the USDOT budget request and directly by Amtrak through its Federal Grant and Legislative Request. The FRA disburses and oversees Amtrak's federal grant funds, which the House and Senate Appropriations Committees choose to appropriate separately, in the form of an operating grant and a separate grant for capital and debt service.

Amtrak's real estate division makes decisions regarding the relationships with other railroads and the commercial development. This has an enormous impact on passengers and how passengers are managed at Amtrak and the other railroads.

The President of Amtrak is a political appointee who often is beholden to making changes in line with the ideology of their appointer. Thus there have been regular changes in management styles with changes in senior leadership. Amtrak's operations have been reorganized several times between product lines and functional divisions. As a result, Amtrak has had trouble with training and retaining new staff. Some former Amtrak staff noted that employees may not be as committed to the railroad as a result. Retention rates for some training programs are at only 25 percent; many who finish up a training course will go on to private employment due to higher wages and other differences in working conditions.

Through discussions with Amtrak employees, it is clear that there is some frustration with the political nature of decision-making and the difference in operational scale between commuter railroads and Amtrak. Amtrak has taken the lead on a number of major projects, expecting support from other players. However, this support is often not guaranteed.

Amtrak currently has little interaction with the commuter railroads apart from being housed in the same station. Currently, their services are aimed at separate markets, with many intercity rail passengers not continuing their journeys outside of the immediate New York City urban area.

3.2.5.1.1 MOYNIHAN STATION

Moynihan Station will be the gateway to New York City for Amtrak. The station will be designed to support intercity travelers, rather than daily commuters, and is being built partly in anticipation of high-speed rail in the NEC. While Moynihan Station is a passenger experience project, the Gateway Project and the new Hudson River tunnels are vital to running both current service and bringing high-speed rail. Amtrak will not own Moynihan Station; the station building is owned by the State of New York and will be leased to Amtrak.

3.2.5.1.2 GATEWAY PROGRAM

The Gateway Project is necessary in order to facilitate future high-speed rail development in the Northeast Corridor. The currently congested corridor does not have the capacity to add additional higher-speed service, which will essentially reduce corridor capacity due to train separation needs.

Amtrak was the lead on the Gateway Program following the cancellation of the ARC project, but was clear that they would not be the only agency involved in the project because of the high cost and the benefit to New Jersey and New Jersey Transit.

3.2.5.1.3 EAST SIDE ACCESS

While East Side Access is a LIRR project, Amtrak has taken advantage of the construction in order to make improvements at their railyards at Sunnyside, Queens. In particular, they are using federal high-speed rail money to build a bypass of the railyards for future higher speed trains.

3.2.5.1.4 EAST RIVER TUNNELS

While not as dire as the Hudson River Tunnels, the East River Tunnels are also in need of significant maintenance. There has been debate with LIRR, the other primary user of the tunnels over the impact of shutting down one or more tracks and how the impacts will be mitigated and spread across the two railroads.

3.2.5.2 METROPOLITAN TRANSPORTATION AUTHORITY (MTA)

The New York Metropolitan Transportation Authority is a state agency (technically a public benefit corporation in the State of New York) responsible for "developing and implementing unified mass transportation policy" in 12 counties (five in the city of New York, and seven surrounding counties) in southeast New York State, as well as two counties in southwest Connecticut. The Authority was chartered in 1968 by the New York State Legislature. The MTA Commuter Transportation District consists of the City of New York, as well as Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk and Westchester counties.

The MTA has 5 subsidiaries and two affiliate entities, all of which are also public benefit corporations. The divisions within the MTA complicate coordination and prioritization of projects and operations. Each agency has its own vision, mission and goals, as well as project and service prioritization.

The MTA is governed by a 17-member board consisting of a Chairman and 16 other voting members. All of the board members are appointed by the Governor with the advice and consent of the State Senate, but only four of the members recommended by the mayor of New York City. A number of the surrounding counties also recommend members, making for a heavily suburban representation on the MTA board. The county executives of Nassau, Suffolk, and Westchester each recommend one member. Dutchess, Orange, Rockland and Putnam counties each also have a member, but these representatives cast one collective vote. Since the governor represents the entire state, they have no direct incentive to appoint individuals partial to the city's interest.

Table 3-5: MTA Subsidiaries and Affiliate Entities

	Name	Number of Employees (as of end of 2009)
Subsidiaries	The Long Island Rail Road Company	6,765 employees
	Metro-North Commuter Railroad Company	5,951 employees
	Staten Island Rapid Transit Operating Authority	271 employees
	MTA Bus Company	3,467 employees
	MTA Capital Construction Company	130 employees
Affiliates	MTA Bridges and Tunnels	1,781 employees
	New York City Transit Authority	49,375 employees

While the MTA is subject to state control, it does not receive regular direct general fund appropriations like many state agencies because it was created to be an independent public authority. Despite this lack of financial control, there is significant control exerted by governors over the agencies. The MTA has no mechanism, however, to hold the state government accountable for its finances.

The chairman of the MTA serves as the CEO of the MTA and its related entities. There are 11 committees to assist the Chairman and the board with their responsibilities (MTA, n.d.).

These committees are:

- Audit Committee (10 Members)
- NYC Transit Committee (12 Members)
- Capital Construction, Planning and Real Estate Committee (12 Members)
- Capital Program Oversight Committee (13 Members)
- MNR Committee (9 Members)
- LIRR/LI Bus Committee (6 Members)
- Bridge and Tunnel Committee (9 Members)

- Safety and Security Committee (8 Members)
- Corporate Governance Committee (8 Members)
- Finance Committee (12 Members)
- Diversity Committee (8 Members)

Despite this, the majority of the MTAs operations and employees are centered in the city; the vast majority of riders use MTA services, and the majority of the funds are spent on maintaining and providing MTA infrastructure in the city. Bridge and tunnel tolls collected by the MTA are used to subsidize transit operations, and 50 percent of the revenue is given to New York City Transit. This is less, however, than its ridership may suggest, but is obviously more than the zero it would receive if it was a separate city agency.

The MTA's investment decisions are skewed towards suburban interests; this is made clear through projects such as the East Side Access project, which is expected to benefit 162,000 customers for a total expected cost of over $10 billion. In contrast, the 2nd Avenue subway project is expected to both relieve congestion on parallel lines, and carry 200,000 riders per day for a cost of $4.4 billion. Despite this, the East Side Access was funded first due to the governor's preference to expand commuter rail service. Another subway project, the extension of the #7 train to the West Side, is being constructed by the city in order to bypass the MTA process.

In terms of fares, New York City Transit covers more of its operating costs through farebox recovery than commuter railroads do, making the subsidy per rider higher for suburban commuters than urban riders.

Although the MTA was created to integrate the existing transit agencies in the New York portion of the metropolitan region, each sub-agency continues to have its own structure and institutional culture. This makes it difficult to change the direction of the MTA, and integrate the operations of the sub-agencies.

Revenue from roadway tolls provides the MTA with a stable and effective revenue source, and is key for its financial stability for financing operations. In the 1970s, there was a significant maintenance backlog, and the MTA system was a symbol of urban decay. Funding for maintenance and improvements came partially from state and federal funds, but primarily from borrowing against future farebox revenues, a trend that continues even today. A portion of the MTA capital budget comes from bonds that are backed by future fares.

Although the state controls the MTA management, it is often critical of MTA management and blames them for funding gaps and other challenges. This means that acquiring funding

often requires a mix of threatening to raise fares or cut service, rather than dialogue about funding needs and effective funding. Some of the tensions come from the role of New York City within New York State, a city with a population of 8 million in a state of 19.3 million.

MTA sub-agencies do not have integrated fare technology; although the Port Authority Transit Hudson (PATH) trains operated by PANYNJ use the Metrocard, used by NYC Transit, the commuter railroads operated by the MTA do not. NYCT operates using a magnetic stripe swipecard introduced in the early 90s.

One barrier to integrated fare technology is physical; the commuter rail systems have no physical barriers into the system, and fares vary based on time and distance. Not even the two MTA commuter rail systems share the same fare medium.

The challenges of integrating the commuter rail services under the MTA highlight the difficulty of integrating the third commuter rail service in the area, New Jersey Transit. The presence of the state border makes for jurisdictional challenges.

The Eno Center report cautions that integrating the commuter railroads may lead to significant cost increases, particularly due to the differing labor agreements between LIRR and MNR. Labor costs for the LIRR are significantly higher than for MNR, and a merger would likely lead to an increase in MNR compensation. The LIRR labor force is made up of 11 separate unions.

There has been discussion historically about shifting control of NYC Transit from the state to the city, but the lack of stable financing without state assistance, bonding capacity and toll revenues makes the prospect very difficult to achieve and potentially unstable.

3.2.5.3 LONG ISLAND RAIL ROAD

LIRR was originally chartered in 1834 in order to carry passengers from New York to Boston via train and ferry, and is the oldest continually operated railroad in the United States. The Pennsylvania Railroad acquired the railroad in 1901, at which time is was a small commuter railroad active mainly in the summer. Alexander Cassatt, the head of PRR at the time, viewed LIRR as a key link to access New England rail markets and to bring rail into Manhattan. The railroad began service to Penn Station when the station opened in 1910.

LIRR's service area extends from Penn Station on the west side of Manhattan to the eastern tip of Long Island and it operates all commuter rail service between the City and Long Island, and within Long Island. LIRR currently serves the West Side of Manhattan, bringing

riders into Penn Station at 34th Street between 7th and 8th Avenues. Business development on the west side of Manhattan has historically been more limited than on the east side.

The East Side Access Project, projected to be completed in 2022, aims to bring LIRR into the east side of Manhattan, closer to many of the white-collar jobs in the city. LIRR will continue to run trains into Penn Station, but it is projected that 160,000 riders per day, about half of LIRR's ridership, will prefer to disembark on the east side of the island. This project has highlighted the contentious relationship that LIRR has with MNR. This toxic relationship led to changes in station design at Grand Central, and the complete separation of service between the two commuter railroads at Grand Central Terminal.

According to conversations with a senior executive at LIRR, the LIRR operates with the goal to best serve its customers. Its main customer base lives on Long Island and commutes into the city; therefore the purview of the railroad is to improve efficiency, access, and experience along this routing. LIRR's stake in Penn Station may depend on the success of the East Side Access project, and the future customer demand for slots at Penn Station. Additionally, changes in Amtrak service and customer demand for connections to intercity or high-speed rail may also affect LIRR's objectives and goals for Penn Station.

LIRR is one of three major commuter railroads in the region, and has the highest ridership of the three as well as the highest ridership of any commuter railroad in the United States. However, it has a historically adversarial relationship with the other commuter railroads due to historic competition, limited space at terminals, and scarce resources for rail transit in the region.

3.2.5.4 METRO NORTH RAILROAD

Metro North is the second largest commuter railroad in the United States, connecting suburban New York and Connecticut with Grand Central Terminal, located on the east side of Manhattan at 42nd Street. It operates commuter rail service between New York City and the northern suburban counties of Westchester, Putnam and Dutchess; from New York City through the southern portion of the State of Connecticut; the Port Jervis and Pascack Valley commuter rail services to Orange and Rockland Counties through an arrangement with New Jersey Transit; and within these counties and the State of Connecticut.

Metro North's stake in Penn Station is dependent on the East Side Access project at Grand Central Terminal. This project will potentially open up space at Penn Station for Metro North's train to come into the station, and provide a new potential market. Not only could Metro North benefit from riders interested in accessing the new and existing development on the west side of Manhattan; there would also be new riders around four new stations in the Bronx who do not currently have access to any commuter rail service.

A major question regarding the expansion of Metro North into Penn Station is how their operations would fit into existing space constraints. If the new agreements at Grand Central Terminal are any indication, it is unlikely that the railroad would want to share ticketing and concourse space with the other railroads. Metro North's extension into Penn Station would not only affect existing Metro North markets, but may also open up other opportunities for Bronx residents to access opportunities along Metro North's lines, as well as for Metro North to leverage new access for businesses in new markets.

3.2.5.5 NEW JERSEY TRANSIT

New Jersey Transit Corporation (NJ TRANSIT) is a state-run corporation that was originally created through the Transportation Act of 1979, which consolidated several private bus companies in northern New Jersey. Through this act it was empowered to run or contract out public transportation services, lease and hold property, and accept money from federal, state, county, municipal and private sources (New Jersey State Rail Plan, 2015).

NJ Transit is the nation's third largest transit agency and operates twelve commuter lines that serve over 77 million trips annually on its commuter rail network, as well as over 155 million bus trips and 20 million light rail trips. NJ Transit measures five performance indicators, implemented in 2011: customer experience, financial performance, corporate accountability, safety and security, and employee excellence.

NJ TRANSIT's commuter rail services began when it acquired the commuter train operations of Conrail in the early 1980s. These routes connect northern and central New Jersey to New York City. Today it operates bus systems, commuter train operations, as well as three light rail systems. Light rail was developed in order to encourage transit-oriented development across New Jersey. Light rail in northern New Jersey has been credited with revitalizing Jersey City, just across the Hudson River from New York City.

While NJ TRANSIT is the primary transit operator with connections not only within northern and central New Jersey, but also to New York City, there are competing private bus operators with service to NYC. New Jersey Transit has seen the fastest growth in ridership of any of the commuter railroads. However, their future growth is currently limited due to the lack of capacity in the Hudson River tunnels. Despite the cancellation of the Access to the Region's Core project by Governor Chris Christie, new Hudson River crossings are vital to NJ TRANSIT's future. The agency has a strong stake in seeing new tunnel crossings, and added redundancy because it has a direct impact on reliability and revenues.

It is possible that this need may make the agency more willing to collaborate around ideas for new solutions for Penn Station. Additionally, NJ TRANSIT is the newest railroad operating in Penn Station with the least amount of contentious history. However, because it comes from out of state and does not have an official relationship with a New York State operator like Metro-North does, it is likely also one of the weaker stakeholders.

NJ Transit does not have a dedicated source of revenue for operations; much of its operating funds come from passenger fares and contracted services, rental income, advertising, leases and parking. Labor costs make up about 53 percent of NJ Transit's annual operating budget (NJ State Rail Plan, 2015). NJ Transit receives operating support from the State of New Jersey and Federal sources to fill its annual operating deficit. The New Jersey Transportation Trust Fund funds capital expenses, such as infrastructure and equipment.

3.2.5.6 NEW YORK CITY TRANSIT

The focus of New York City Transit is to move people within the City limits. Regional and intercity rail impacts ridership at key terminal points, affecting the planning and capacity needs of the adjoining stations. With limited funding available, the MTA board must be selective in the projects it allocates funding to; the strong regional and suburban representation on the MTA board likely affects the funding available for urban rail projects.

Through interviews with top officials at MTACC, LIRR and local non-profit organizations, it was clear that many felt that East Side Access was a less necessary project than many major transit projects, such as the second phase of the Second Avenue subway project, that were passed over in order to fund it. The Second Avenue Subway, a project discussed since the early 20th century, will add extra capacity to the Upper East Side of Manhattan. The only existing line, the Lexington Line, is over capacity. The first phase of the Second Avenue Subway project is expected to be completed in late 2016, but the funding for the second phase is uncertain. However, suburban political power enabled the East Side Access project to take priority, despite impacting significantly lower numbers of people.

An additional role that NYCT may play in the Penn Station development is the relationship with the new Hudson Yards Development on the west side of Manhattan. The 7-line extension is slated to open by 2017, and may supplement access to the new developments.

3.2.5.7 PANYNJ PATH TRAIN

The Port Authority Trans-Hudson Corporation (PATH) was established in 1962. It is a heavy rail rapid transit system that is a transit link between lower Manhattan and New Jersey. The system currently carries 244,00 passenger trips per weekday.

The PATH train started operations as the Hudson and Manhattan Railroad. It was initially planned in 1873 in order to link major rail stations in New Jersey with New York City. The first trains ran in 1907, with revenue service starting in February 1908.

3.2.6 NON-PROFITS/CIVIL SOCIETY

3.2.6.1 REGIONAL PLAN ASSOCIATION

The Regional Plan Association is a non-profit founded in 1922 in order to plan for the future growth of the New York region. It was the first effort to recognize a New York metropolitan region that encompassed New Jersey and Connecticut. The first product of the RPA was the *1929 Regional Plan of New York and Its Environs*. The RPA has since released three more regional plans in 1969, 1996 and 2013.

As a civic group, the RPA is able to transcend the complications of politics, and political terms and boundaries in order to make long-range and far-reaching proposals about the best direction for the region in the future. The goal of the first regional plan was to introduce rationality to the rapid growth of New York City. By the 1960s, many of the recommendations of the first plan had been implemented except for transit connections. Between 1945 and 1970, subway ridership decreased by half, while the surface area of developed land in the region tripled, despite only a 50 percent growth in population.

Not only was the region suburbanizing, but between 1950 and 1965, one in five Manhattan residents moved out of the borough, followed by rapid growth in suburban jobs, which grew by 20 percent. The second regional plan focused on the alarming sprawl and its related environmental degradation, and called for Manhattan to become the commercial, financial and cultural capital not only of the region, but of the nation, and for focus on regional centers including Jamaica, Queens; Downtown Brooklyn; Newark, New Jersey; and Stamford, Connecticut (SPUR, 2013). This relied heavily on the revitalization of the regional rail system in order to provide an alternative to suburban office parks accessible only by car. RPA was a leader in pushing for the federal government to fund transit in the same way it funded highways.

The third regional plan came after a severe economic downturn in the early 1990s. The New York region lost 770,000 jobs between 1989 and 1992. The third plan focused on continuing to combat suburbanization, as well as address a grower income gap and rising crime rates. The plan focused on economy, environment and equity forming the basis of quality of life, prosperity and vitality. In this plan the RPA proposed introducing congestion pricing, building the Second Avenue Subway, originally proposed in the 1929 plan, and creating new public institutions to finance and provide regional services, including a tri-state transportation authority, and a tri-state infrastructure bank.

The Regional Plan Association is able to look beyond just the day-to-day operations of New York City to envision the structures necessary for a prosperous and stable region. Penn Station is at the core of the regional rail system, and as suburbanization and sprawl continue to be challenges, provides opportunities for alternative means of transportation.

3.2.6.2 THE MUNICIPAL ART SOCIETY OF NEW YORK

MAS NYC is an advocacy organization that "fights for intelligent urban design, planning and preservation through education, dialogue and advocacy". The organization was founded in 1893 "to beautify New York City parks and public buildings with murals and sculptures financed by membership dues".

MAS has been an active advocate for a new Penn Station within the context of the new growth in West Midtown. "The severe limitations of Penn Station inhibit the growth of regional rail, while stifling growth and limiting economic opportunity in West midtown and across the city" (MAS, 2016). The MAS focuses on the connections between land use and transportation. At Penn Station, they are active in exploring the impact of new development by Vornado and Related Companies in the district, and the relationship with commuter rail. They have been active in supporting the Moynihan Station project. As public advocates, their role is push the public discussion and advocate for idealistic solutions.

3.2.6.3 STRAPHANGERS CAMPAIGN

The Straphangers Campaign is part of the New York Public Interest Research Group. It was created in 1979 to advocate for better public transit in New York City on behalf of riders. It is a grassroots organization.

3.2.6.4 TRI-STATE TRANSPORTATION CAMPAIGN

The TSTC is a 501(c)(3) non-profit advocacy organization formed in 1993 in response to the 1991 passage of the Intermodal Surface Transportation Efficiency Act (ISTEA). It is an advocacy organization focused on reducing car dependency in New York, New Jersey and Connecticut, and advocating for improvements in public transportation, pedestrian and bicycle facilities.

The TSTC board of directors consists of senior staff from the founding non-profit transportation, planning and environmental organizations, as well as representatives from industry and the private sector. The TSTC has 10 staff, and is headquartered in Manhattan.

3.2.6.5 ALLIANCE FOR A NEW PENN STATION

The alliance for a new Penn Station consists of MAS NYC and the Regional Plan Association as well as:

- American Planning Association

- American Society of Landscape Architects
- Vishaan Chakrabarti, AIA, Partner, SHoP Architects, Holliday Professor and Director, CURE., Columbia University
- Joshua David
- Design Trust for Public Space
- Barry Diller
- Fine Arts Federation of New York
- Paul Goldberger
- Robert Hammond
- Historic Districts Council
- Hugh Hardy
- State Senator Brad Hoylman
- Jerry Hultin
- Jan Nicholson
- Manhattan Community Board 4
- Manhattan Community Board 5
- NYPIRG Straphangers Campaign
- Bette Midler
- Edward Norton
- Elizabeth Barlow Rogers
- Gruzen Samton
- Robert A.M. Stern
- Transportation Alternatives
- Tri-State Transportation Campaign
- Untapped Cities

The vision and goal of the Alliance for a New Penn Station was to launch a public campaign to overhaul Penn Station and promote the relocation of Madison Square Garden.

3.2.7 PRIVATE SECTOR

3.2.7.1 MADISON SQUARE GARDEN

Madison Square Garden is a private entertainment complex that sits directly on top of Penn Station. The facility has moved four times since it opened in 1879, but it opened in its current location in 1968. Today, Madison Square Garden hosts approximately 350 events each year and is the home base for two major sports teams in New York.

When the original Penn Station headhouse was demolished in 1963, Irving Felt, who would later become the Garden's chairman, purchased the air rights from the Pennsylvania Railroad, and built one of the first structures of its kind over an active rail station. The

decision was made for a new Garden in order to create a newer and more modern facility that would be more flexible, could handle larger crowds, and provide unobstructed views of events. The Garden was granted a special land-us permit in 1963 for 50 years.

In 2011, the City of New York voted to only extend Madison Square Garden's lease over its space for 10 years, instead of the continual lease that the owners had asked for. This indicated that there was a desire on the part of New York City to reconsider the location of Madison Square Garden. However, the MSG completed major multi-million dollar renovations in 2011, and its location on top of Penn Station benefits the company greatly because of the easy access to suburban connections for visitors to its events. It is not necessary for these riders to make connections, many of who may not be regular transit riders. The draw of entertainment and the lack of parking in Midtown make transit and regional rail an attractive travel options, and benefits MSG. While alternative locations for MSG have been explored, it is not in the interests of the company currently to uproot its operations. Today, Madison Square Garden is the oldest professional basketball and hockey stadium in operation in both the National Basketball Association (NBA) and National Hockey League (NHL).

3.2.7.2 PENN PLAZA

Penn Plaza is a commercial building housing office, entertainment and hostel space neighboring Penn Station. It houses Madison Square Garden, as well as the One and Two Pennsylvania Plaza office buildings. Vornado Realty Trust, a major real estate company that owns over 20 million square feet of office space in Manhattan, owns One and Two Penn Plaza.

Penn Plaza benefits financially from commerce within the station. While LIRR, Amtrak and NJ TRANSIT operate some commercial operations within the station, Penn Plaza is the primary commercial operator in the station. While many passengers are unaware of the ownership differentiations, each owner operates their commercial properties differently.

Penn Plaza recently announced plans to redevelop its Penn Station commercial properties in order to bring in higher end development more similar to that at Grand Central terminal. While high-end is not the historic perception of Penn Station, better commercial properties may be able to help drive changes in station operations.

3.2.7.3 MANHATTAN EMPLOYERS

Employers located in Manhattan want to be able to attract workers from throughout the region. Accessibility is important, but reliability is as well. Breakdowns or delays affect worker productivity and ultimately a company's bottom line, particularly if they happen often. This is particularly important because commuters from outside Manhattan nearly

double the borough's population. During the day, the population increases from 1.6 million to 3.1 million, based on 2010 Census data.

Overall, the net increase in New York City's population due to commuting is 608,000 (Roberts, 2013). Across the city, every borough except Manhattan registers a decline in daytime population due to workplace travel patterns. In Queens, the Bronx and Staten Island, fewer than half o the workers live and work and in the same county. Only about 270,000 New York City residents work outside of the city.

3.2.7.4 HUDSON YARD DEVELOPERS: RELATED COMPANIES

Related Companies is a real estate firm based in New York City. It is the largest owner of luxury residential rental properties in New York City, and has over 7,000 units. Related has also been the developer for projects including the Time Warner Center in NYC.

Related, in a joint venture with Vornado Realty Trust, were selected in 2005 to lead the Moynihan Station project, paying the state of New York $310 million for the development rights to develop retail in a future Moynihan Station. In 2015, New York State announced that it was considering replacing the companies as developers. Under the terms of the previous agreement, the state would be required to reimburse the developers for $30 million in expenses, and may be barred from soliciting new developers for a year (Bagli, 2015).

3.2.7.5 VORNADO REALTY TRUST

Vornado Realty Trust is a real estate firm based in New York City, and is the dominant property owner in the area surrounding Penn Station. Vornado acts primarily as an office and retail landlord and owns about nine million square feet in the Penn Station area, including One and Two Penn Plaza (Brown, 2015).

3.2.7.6 TRANSPORTATION NETWORK COMPANIES

Transportation network companies operating in New York City include Uber, Lyft and Via, among others. TNCs are defined by the New York State Senate as "an organization, including, but not limited to, a corporation, limited liability company, partnership, sole proprietor, or any other entity, operating in this state that provides prearranged transportation services for compensation using an online-enabled application or platform to connect passengers with drivers using a personal vehicle" (Seward, 2015).

3.3 RAIL STATIONS

3.3.1 NEW YORK PENN STATION

Penn Station, while technically a through station (for Amtrak trains), operates as two stub-end terminals for regional rail (LIRR and NJ TRANSIT). Instead of one through train taking up a single train slot, two separate trains are needed. This not only limits available track

capacity at the station, but also requires midday storage yards to be located in the center of the metropolitan area (West Side Railyards for LIRR and Sunnyside Railyards for NJ TRANSIT).

Further detail on Penn Station is available in Chapter 4.

3.3.2 Grand Central Terminal

The other major station in New York serves exclusively Metro North trains, despite having 44 platform tracks and being the largest railway station in the world. The East Side Access project to bring LIRR to Grand Central is not making use of these tracks, but is rather building a third stub-end terminal in Manhattan exclusively for LIRR. A fourth stub-end terminal was proposed in Manhattan as part of the Access to the Region's Core (ARC) project, but was cancelled in 2010.

3.4 The Future of Rail in the New York Region

Much of the discussion of future rail developments in the Northeast Corridor stem from discussions of high-speed rail and new alignments in the mega-region, or from complications resulting from Hurricane Sandy and the need for redundancy and increased capacity across the Hudson River. Additional projects have been proposed to improve the experience of passing through Penn Station.

3.4.1 High-Speed Rail

3.4.1.1 Northeast Corridor High-Speed Rail

The Northeast Corridor consists of a 457-mile main line that stretches between Boston, MA and Washington, DC. It carries over 1,500 trains per day with 710,000 commuter rail and 40,000 Amtrak passengers per day. There are five major metropolitan areas along the corridor, and one of every three jobs in the region is accessible from the NEC.

A one-day failure of the NEC would cost the nation $100 million due to additional highway congestion, productivity losses and other transportation impacts (Northeast Corridor Commission, 2014). The corridor is currently experiencing record ridership levels, but the infrastructure along the corridor is deteriorating. Much of the NEC was built in the late 1800s and early 1900s, and much of the infrastructure along the corridor is in need of replacement or significant maintenance.

There are 13 owner/operators along the corridor. Amtrak operates from end-to-end, and owns much of the infrastructure, but there are 10 commuter rail authorities, as well as six freight operators that use the network for a portion of their service.

The commuter operators along the corridor are:

1) Massachusetts Bay Transportation Authority (MBTA)
2) Shore Line East (SLE) operated by Amtrak under contract to the Connecticut Department of Transportation (CDOT)
3) Metro-North Railroad (MNR)
4) Long Island Rail Road (LIRR)
5) New Jersey Transit (NJ TRANSIT)
6) Southeastern Pennsylvania Transportation Authority (SEPTA)
7) Maryland Area Regional Commuter (MARC) operated by Amtrak under contract to the Maryland Transit Administration.
8) Virginia Railway Express (VRE)

Amtrak owns the right-of-way between Washington DC, and New Rochelle, NY, and between New Haven, CT and the Rhode Island-Massachusetts border. The New York Metropolitan Transportation Authority (NYMTA) and CDOT own the New Haven Line, which is operated and controlled by MNR. The MBTA owns the right-of-way from the Massachusetts-Rhode Island border to Boston-South Station. Amtrak dispatches and maintains the right-of-way in Massachusetts under an agreement with the MBTA. Station ownership varies and includes Amtrak, commuter authorities, states, local governments, and other entities. Amtrak owns Penn Station, NYC.

A timeline showing the complete history of development in the Northeast Corridor is shown Table 3-6.

Table 3-6: Summarized history of development on the Northeast Corridor (Adapted from: Regional Transportation Planning and High Speed Rail Research Group, MIT, "NEC Future Tier I Scoping Process: Public Comment".)

Year	Description (Compiled from: FRA 1994, and de Cerreño and Mathur 2006)
Early 1900s	The Pennsylvania Railroad Company (PRR) owns the New York City to Washington, D.C. portion of the NEC, and the New Haven Railroad Company (NHRR) owns the New York City to Boston portion. The PRR constructs tunnels under the North and East Rivers to connect Manhattan to both the northern and southern portion of the NEC.
1914	NHRR installs a catenary system from New York to New Haven following a steam locomotive accident around New York.
1917	The Hell Gate Bridge from upstate New York to Queens is constructed.
1928 to 1935	The New York City to Washington, D.C. portion of the NEC is electrified.
1961	NHRR enters bankruptcy and remains under court supervision until it is acquired by the Penn Central Transportation Company.
1963	Congress establishes the NEC Project Office within the Department of Commerce.
1965	The High-Speed Ground Transportation Act provides $51.8 million for high-speed rail demonstration projects on the NEC (including Metroliner [southern section] and Turbotrain [northern portion] services), and establishes the Office of High-Speed Ground Transportation (OHSGT), which takes over the NEC Project Office.
1967	The United States Department of Transportation is created and takes over the OHSGT from the Department of Commerce.
1968	The merger of the PRR and New York Central Railroad creates the Penn Central Transportation Company (PCT)
1969	NHRR is acquired by the PCT. Metroliner service between Washington, D.C. and New York City is established. In 1975, the travel time between these two cities is about 3 hours, but due to poor track infrastructure, it is not able to reduce travel times further.

	Turbotrain (a train powered by jet engine technology) is placed into service on the north end of the NEC from Boston to New York City, but due to mechanical difficulties, it was taken out of service in 1976.
1970	The Rail Passenger Service Act (RPSA) creates Amtrak to take over most intercity passenger rail services in the U.S.
1973	Although primarily concerned with freight railroads, the Regional Rail Reorganization (3R) Act commissions engineering studies to look at improving passenger rail service.
1976	Amtrak acquires most of the NEC as a result of provisions in the Railroad Revitalization and Regulatory Reform (4R) Act. The 4R Act establishes goals for shorter rail travel times between Boston and New York City and New York City and Washington, D.C. of 3:40 (h:mm) and 2:40, respectively, by 1981. The authors de Cerreño and Mathur (2006) note that these travel time goals and corresponding funding amounts were largely set through negotiation as opposed to by any formal analysis. To achieve these goals, the 4R Act creates the Northeast Corridor Improvement Project (NECIP) and appropriates $1.75 billion for infrastructure improvement projects. This amount was later increased in 1979 to $2.5 billion as a result of the 1979 U.S. DOT "Northeast Corridor Improvement Project: Redirection Study," which concluded that the draft Programmatic Environmental Impact Statement (DPEIS) did not appear to adequately consider commuter and freight operations, and that the project's scope, schedule and budget was not adequate.
1978	The FRA's final Programmatic Environmental Impact Statement (FPEIS) is released. It evaluates broad options for upgrades to the NEC, and, in particular, considers three alternative routes.
1980	The Passenger Railroad Rebuilding Act directs the FRA to transfer management of the NECIP to Amtrak by 1985. It also increases the funding amounts to $2.5 billion (as described above) and lengthens the project to seven years in total.
1992	The Amtrak Authorization and Development Act (AADA) commits $470 million per year to the NECIP for 1994 and 1995, sets a statutory goal of three hour travel times between Boston and New York City and requires that a master plan be

	developed to achieve this goal.
1994	Secretary of Transportation Federico Peña issues The Northeast Corridor Transportation Plan: New York City to Boston, which estimates a cost of $3.1 billion to complete the electrification of remaining portion of the NEC, reduce trip times to AADA requirements and generally increase capacity on the NEC. The FRA releases the final Environmental Impact Statement/Report (FEIS/R) for the electrification of the NEC from Boston to New Haven.
Late 1990s	Amtrak installs electrical catenary between New Haven and Boston.
2000	Amtrak begins (initially limited) Acela high-speed rail service on the NEC
2008	The Passenger Rail Investment and Improvement Act (PRIIA) appropriates funds to Amtrak for 2009 to 2013. It also requires Amtrak to develop a master plan for the NEC.
2009	The American Recovery and Reinvestment Act (ARRA) provides around $10 billion in funding for high-speed rail projects around the U.S.
2010	The NEC Infrastructure Master Plan and A Vision for High-Speed Rail in the Northeast Corridor are released by Amtrak.
2012	MIT/ITPS Transportation in the Northeast Corridor of the U.S. report is released MAP-21 is passed and the NEC FUTURE study is initiated NEC Future Scoping Summary released The Amtrak Vision for the NEC update report released
2013	NEC Future Preliminary Alternatives Report released

3.4.2 Increased Capacity Across the Hudson River

3.4.2.1 Access to the Region's Core

The Access to the Region's Core (ARC) project was proposed by New Jersey Transit in order to provide increased capacity from Secaucus, New Jersey to Manhattan. The project included the construction of two new tunnels under the Hudson River, new rail tracks between Secaucus Junction and New York Penn Station, a new six-track rail station underneath 34th Street in midtown Manhattan with pedestrian linkages to Penn Station, a new rail storage yard in Kearny, New Jersey, and the purchase of new locomotives and rail coaches. ARC was cancelled by Governor Chris Christie in 2010, and the cancellation of the project spurred the development of the Gateway Project.

3.4.2.2 Gateway Project

Amtrak's Gateway Project aims to increase capacity and add redundancy to the existing tunnels by adding two new tracks under the Hudson River from the NEC line in New Jersey into Penn Station. The existing link tunnels under the Hudson are reaching their lifespan and will need perpetual service and eventual replacement. The new tunnels are meant to serve both New Jersey Transit, as well as future high-speed rail growth into Penn Station. This project was expedited in response to the cancellation of the Access to the Region's Core (ARC) project by Governor Christie in 2010.

The Gateway Project is expected to increase the rail capacity of NJ Transit into New York by 65 percent, or from 20 to 33 trains per hour during peak hours. The new track alignments, shown in Figure 3-7, would connect both to Moynihan Station, the new Amtrak headhouse located in the Farley Post Office building west of Penn Station, as well as a new Penn Station South adjacent to the existing Penn Station to accommodate the new tracks. Figure 3-8 shows the Gateway Project in its entirety, including new rail bridges in New Jersey.

Figure 3-7: New track and tunnel alignment for the Gateway Project. (Amtrak, 2011)

The project is not only expected to increase capacity for NJ Transit trains, but for all operators, as shown in Table 3-7. The Gateway project is meant to not only increase the number of NJ Transit users with a one-seat ride to Manhattan, but also to establish Amtrak's new Moynihan station as a grand station and high-speed rail hub for the United States and Northeast Corridor.

In November 2015, the federal government agreed to pay fifty percent of the cost of the Gateway Project, while New York and New Jersey each pledged to pay twenty-five percent.

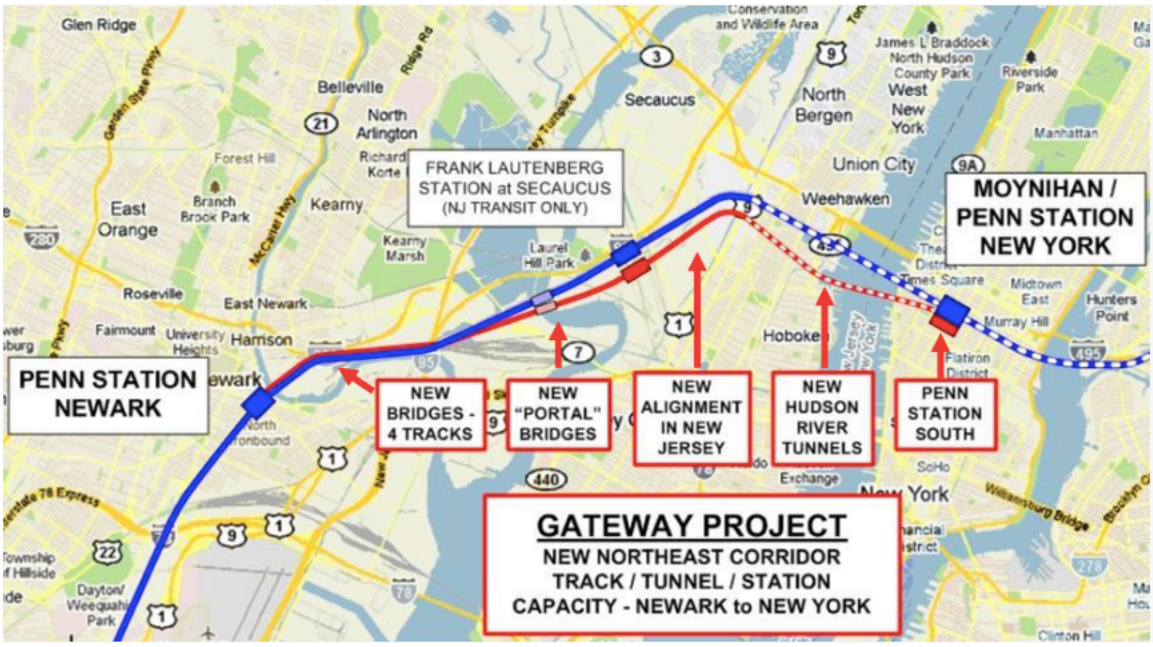

Figure 3-8: The Gateway Project. (Real Transit, 2013)

Table 3-7: Increased Capacity for All Operators with Gateway Project

Service	Existing Capacity	Projected Capacity with Gateway Project
Amtrak NEC trains/hr	4	12
Empire Corridor	1	3
NJ Transit	20	33
LIRR	37	38
Metro-North	0	6
Total Trains/hr	62	92

3.4.2.3 MEADOWLANDS "TRAIN TO THE GAME"

In 2009, Metro-North together with NJ Transit introduced direct service from the New Haven, CT to Secaucus Junction in New Jersey in order to serve the Meadowlands Sports Complex, where both the New York Jets and Giants play. This is a strong example of the potential success of through running trains at Penn Station. While this is a small-scale implementation, three NJ Transit trains run from New Haven, Connecticut on Metro-North's New Haven Line through Penn Station to the Secaucus Junction in New Jersey.

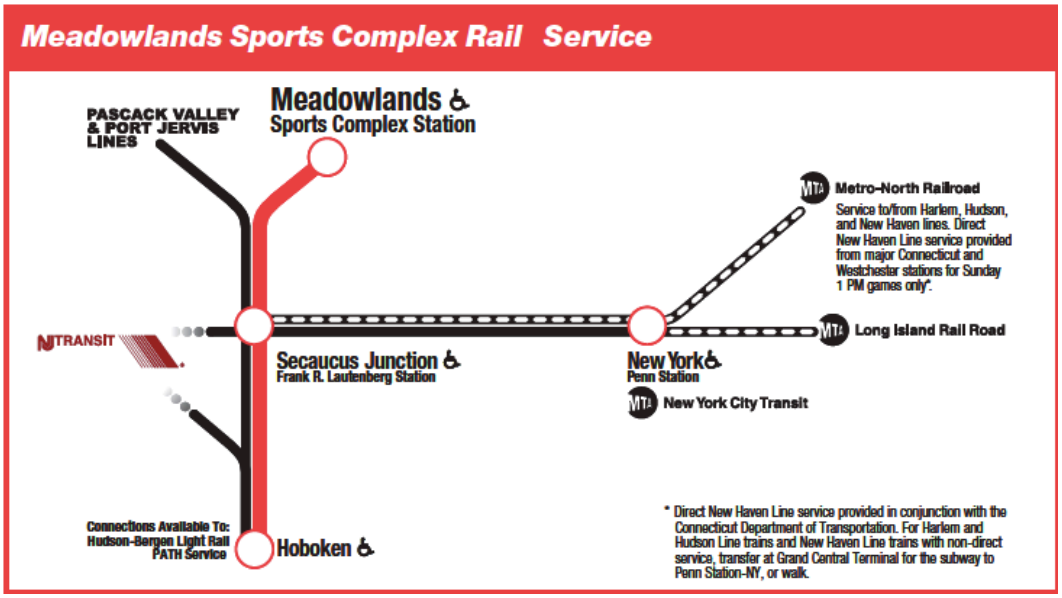

Figure 3-9: Meadowlands Sports Complex Rail Service. (MTA, n.d.-b)

Former MTA chief Elliot Sander was a proponent for the football trains and said that "the barriers to regional rail are less geographic and more institutional, labor and political" (Barara, 2009). Through running brings questions of whose trains to use, whose labor to use and how to split operating costs and ticket revenues. Another barrier to through running is that NJ Transit, Amtrak and Metro North's New Haven line use overhead catenary wires to power their trains, while the LIRR and Metro North's other lines use an electrified third rail.

3.4.3 PENN STATION

3.4.3.1 MOYNIHAN STATION

One project currently underway in order to relieve congestion in the existing Penn Station is to convert the Farley Post Office into Amtrak's new Manhattan home, to be known as Moynihan Station. The Farley Post Office building is located across 8th Avenue from Penn Station. The first phase of the Moynihan project is currently underway and is expected to be completed in 2016. This phase consists of three major parts: creating access to tracks 5-

21 at Penn Station from the Farley Post Office building, expanding the existing corridor that will connect the new West End Concourse to the existing station including new subway entrances to the A,C,E subway station and installing a new ventilation system for the railroad platforms beneath the Post Office building (ESDC, 2014). The second phase of the project includes building a new train hall in the renovated Post Office building to be used exclusively by Amtrak. This phase does not yet have a timeline (Freemark, 2005a).

The Farley Post Office building is owned by the State of New York and will be leased to Amtrak and the remaining post office services. In the 2009 State of New York Rail Plan, a fully functioning and convenient Moynihan Station was cited as one of the state's main passenger rail goals (NY Rail Plan, 2009). State investment in Moynihan Station was announced in September 2008 by then Governor Paterson with specific conditions attached to ensure that investment and improvement would be coordinated with other major development projects. The conditions included an increase in overall capacity at the Penn Station Complex (existing Penn Station and the new Moynihan Station) through an increase in the number of tracks and platforms and through operational changes by the operating railroads, as well as coordination with other major development projects (at the time including the Access to the Region's Core project) and ensuring community revitalization around Penn Station (NY Rail Plan 2009).

A transportation project manager for the Moynihan Station Development Corporation, noted that one of the main motivations for the project is the limited vertical circulation at Penn Station. There is not currently sufficient waiting space on the platforms, which is unlikely to change, and so efficient movement of passengers to waiting trains is vital. The opening of Moynihan Station and movement of Amtrak passengers there was framed as one method to reduce the pressure on vertical circulation to platforms. It also allows for separation between intercity and regional rail passengers. The West End Concourse of the Moynihan Station project will be complete in 2015; this project will provide additional vertical circulation between the platforms and concourse levels to the LIRR and Amtrak platforms. This portion of the project does not rely on the completion of the station headhouse. New Jersey Transit declined to be involved in the project, so the West End Concourse does not extend over their platforms.

Figure 3-10 shows a rendering of the Farley Post Office Building including the new West End Concourse, as well as the 33rd St connector between the two stations. While moving Amtrak's concourse and offices into the new Moynihan station opens up space at the existing Penn Station, it does not solve the existing track and tunnel capacity issues or the poor concourse layout of Penn Station. It also opens up questions of the ease of intermodal connections as passengers exit trains further from local transit options.

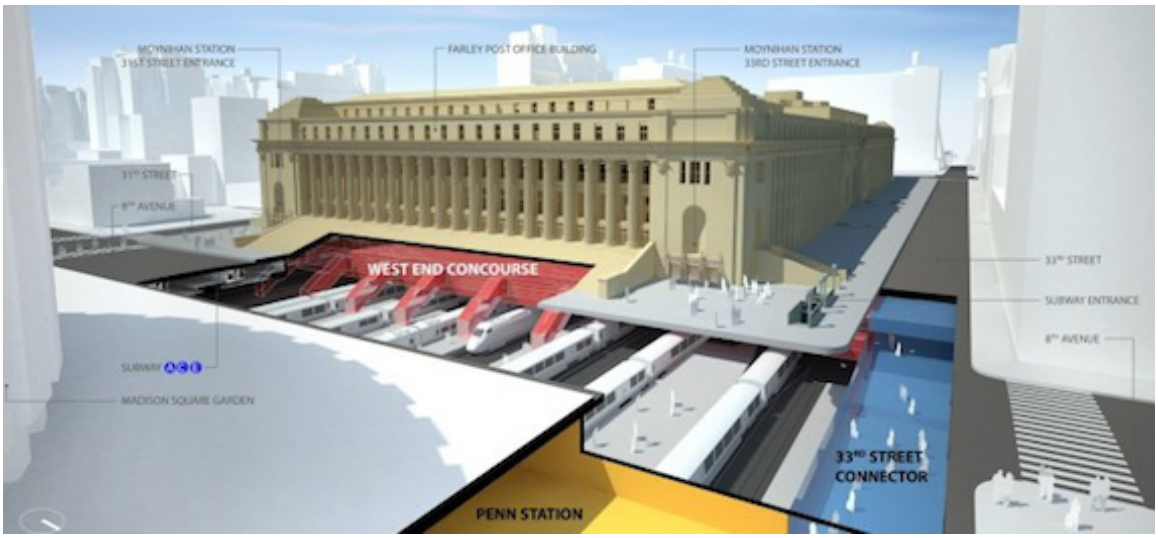

Figure 3-10: A View of the Farley Post Office building from the existing Penn Station.

3.4.3.2 PENN STATION VISION

This is a report completed by AECOM that was jointly commissioned by the MTA, NJ Transit and the Port Authority. It was meant to be released in summer 2012, but is not available publicly. Some sources indicate that several of the transit agencies involved have tried to prevent the report's release. The report is meant to include indications of how capacity can be increased at Penn Station given its current set-up, and articles have indicated that it may talk about through-running.

4 CASE STUDY: THE GATEWAY PROJECT AND PENN STATION

Penn Station is the physical manifestation of institutional challenges in the region and provides a window into the relationships between stakeholders. The Gateway Project is a current project illustrating decision-making and tensions between stakeholders, and is vital for the future of Penn Station and regional rail. In order to explore decision-making and the policy network affecting the region, we will focus on understanding the impact of the current structure on these two projects.

4.1 HISTORY OF TRANS-HUDSON RAIL TRAVEL

Penn Station has a storied history dating back to 1910 when the original Beaux Arts-style station was constructed. The station served as a hub for riders traveling under the East River to Long Island, as well as riders crossing the Hudson River to New Jersey. At full capacity it served 100,000 riders on trains crossing both rivers. It occupied two city blocks between 31st and 34th Streets, between 7th and 8th Avenues. It was an ornate structure, and was considered among New York's architectural treasures. It was built at a time when rail in America was on the rise, and reaching New York City by rail was particularly important.

Today, Penn Station serves nearly 500,000 passengers daily on four different rail services (Amtrak, Long Island Rail Road, New Jersey Transit and New York City Transit). The original headhouse of the station was demolished in the 1960s to the distress of many. The demolition of the headhouse led to the creation of the Landmark Law and the Landmarks Preservation Commission, "an agency with government power to designate and even save historical buildings and neighborhoods" (Broyles, 2012). A year later, the National Historic Preservation Act was enacted. It spurred much of the historic preservation movement in NYC.

Today the station is constrained under Madison Square Garden, shown in Figure 4-1, an indoor arena home to the New York Rangers of the National Hockey League, the New York Knicks of the National Basketball Association and the New York Liberty of the Women's National Basketball Association. Passenger space is very constrained and the experience of transferring through Penn Station has been likened to that of rats scurrying through a tunnel (Kimmelman, 2012).

Figure 4-1: Madison Square Garden

Beyond passenger experience, the two-track tunnel that carries trains from New York City to New Jersey was originally opened in 1910. Seriously damaged during Hurricane Sandy in 2012, the North River Tunnels underneath the Hudson are in need of major repairs. Not only is demand for travel across the river growing, but Amtrak has also released a report that within a decade, capacity may be reduced by 75% due to needed repair work in the tunnels. The Gateway Project aims to increase capacity across the Hudson, and introduce much needed redundancy to the route by building two additional tracks under the Hudson.

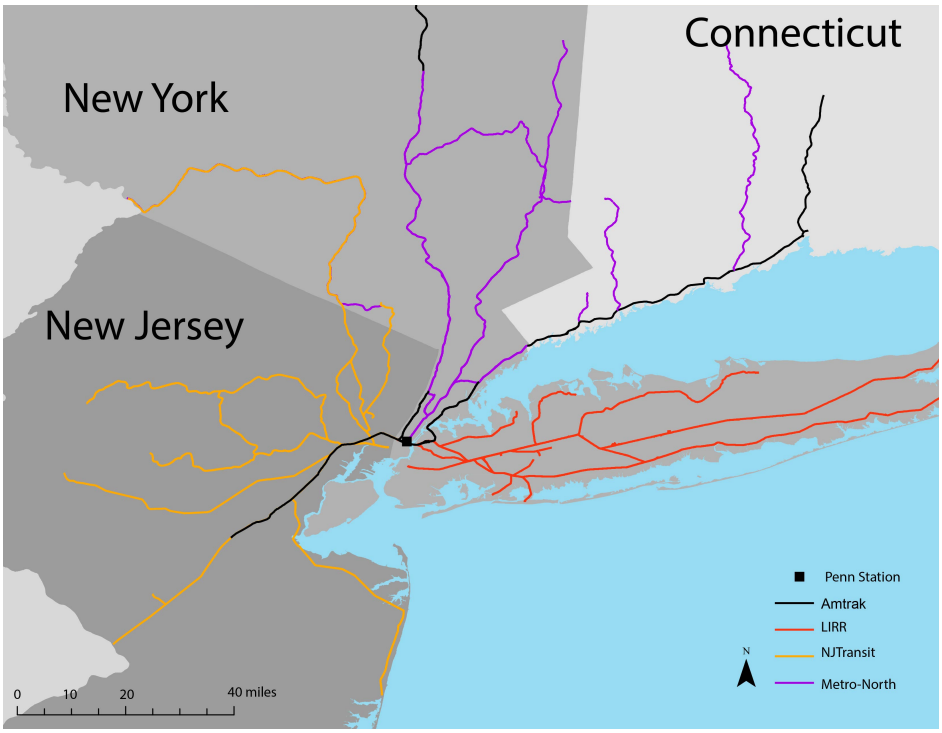

Figure 4-2: Map of New York Metropolitan Region and the Rail Operators serving Penn Station (including Metro North, which may serve Penn Station in the future)

4.1.1 History of Penn Station and the North River Tunnels

The history of Penn Station is not straightforward. In 1901, there was only one bridge, the Brooklyn Bridge, connecting Manhattan to another piece of land, and only one railroad came directly into Manhattan (Jonnes, 2008). The other ten railroads serving New York City built large waterfront terminals in New Jersey and operated ferry fleets, as shown in Figure 4-3, in order to bring passengers into the heart of New York City.

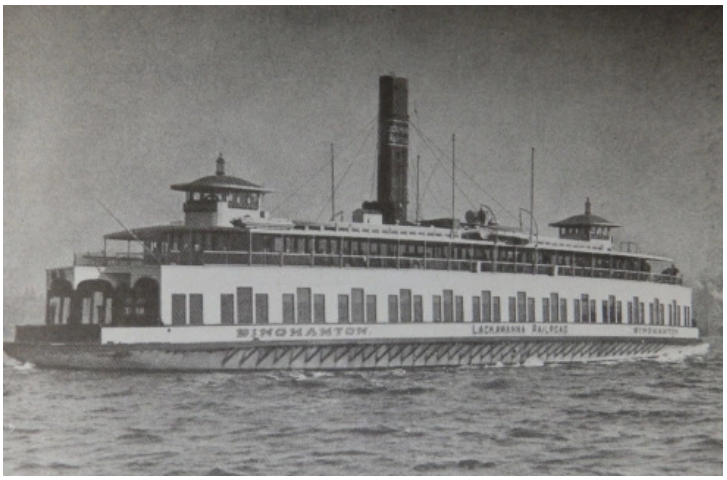

Figure 4-3: Railroad ferry crossing the Hudson River from New Jersey to New York in the early 20th Century (Van Dorp, 2014)

Led by Alexander J. Cassatt, long considered "the 'most brilliant railroad official in this country'" (Jonnes, 6), the Pennsylvania Railroad undertook the massive project of spanning the mile-wide Hudson River in order to bring service directly into the city. The preferred option for crossing the Hudson was not always a tunnel; the North River Bridge project had been proposed as early as 1884. It was long seen as the only solution that would match the needs of the Pennsylvania Railroad, and would serve as a grand entrance into New York City into a new Union Station. The cost was projected to be $100 million including the bridge itself, as well as the station, hotels, warehouses, right-of-ways and real estate. A federally chartered project, it would have to serve not only the Pennsylvania Railroad Company, but also the other lines into the city. However, the smaller railroads, including the Central Railroad of New Jersey, the Erie and the Baltimore & Ohio, refused to sign onto to the project. Since it was such an important project for the Pennsylvania Railroad, and by federal law would be required to be open to all railroads, paying would not make sense for these smaller railroads. This is just the beginning of the lack of cooperation among railroads in the New York region.

The project was too expensive for one company alone, and so PRR began exploring other options to cross the Hudson River. They looked to a new station in Paris that had just been built – the Gare du Quai d'Orsay. It was a grand monument opened for the Paris Exposition

of 1900 and had a magnificent head house with the actual train tracks below ground, coming into the station via tunnels. Building this type of station would require electric trains and engines to avoid smoke in the tunnels, and also brought to the forefront concerns about tunnels and corrosion, settlement and possible shipwrecks in the Hudson.

A decision had been made that the Pennsylvania Station would serve not only trains coming in from New Jersey, but also LIRR trains from the tunnels under the East River. This complicated the siting of the station, and meant that the suggested location was in a "troublesome" section of New York, between West 31st and 33rd Streets between 7th and 9th Avenues. This real estate needed to be acquired secretly before plans for the tunnel were divulged. The properties on these blocks belonged to over two hundred owners. Despite being a notorious vice district, the area was also home to many immigrant families and lower-income residents. In addition to all of this, Tammany Hall, a powerful political organization known for controlling New York City politics from the late 18th century to the mid-20th century, protected the area. At the time of the planning of the tunnel, two state house legislative committees had investigated Tammany Hall for corruption.

The tunnel project was moving forward, however, and the plan was to build a double-track line across the Hackensack Meadows in New Jersey, then dig two tunnels through the Bergen Cliffs and underneath the mile-wide Hudson River into a new terminal. Four tracks would then emerge on the other side into four separate tunnels under the East River, two for LIRR onto Long Island, and two for PRR trains to terminate in rail yards in Sunnyside, Queens. A major goal of these tunnels was to alleviate the crowding and slums in New York City by opening up rural New Jersey and Long Island.

Tunneling under the Hudson was considered a very risky project; in total, 16 miles of tunnel needed to be built, more than tunneled in the Alps, and at the time the longest underwater tunnel was only four and a half miles long. There was concern about the currents in the Hudson River causing drifts and shifting the tunnels. Beyond the technical challenges facing the project were the political challenges. Tammany ruled Manhattan, and everybody from businesses to city employees paid money for getting and keeping jobs, and conducting business. The Pennsylvania Railroad was the second largest corporation in the United States after U.S. Steel, and presented an opportunity for Tammany to reap large benefits. However, Cassatt was against bribes and secret deals, particularly given the vast benefits the project would have for the city, including a grand new terminal, thousands of construction jobs, an economic asset and a permanent connection with the rest of the nation.

The tunnel project slowly moved forward as a private project with minor public concessions: the city could put in police and fire phone, and telegraph wires in the tunnel;

it would be under the city's police laws. The tunnel bill barely passed the Tammany Board of Alderman with the 40 votes necessary without the usual bribes necessary at the time. Public opinion was strongly in favor of the project, though there was still worry even among the railroad's conservative financiers.

Cassatt proposed single-track tunnels in order to increase the perceived safety of the tunnels, and to limit accidents to only two causes – a breakdown, or a tail-end collision. The engineering challenges remained immense, however. A better part of a year was spent gathering engineering ideas and evaluating alternatives, a challenge due to heavy river traffic, swift currents, steep grades and rising costs.

Figure 4-4: The Original Penn Station (NYC Architecture, 2016)

The "highly visible crown jewel of a colossal but largely subterranean engineering feat", the Hudson River tunneling project, however, was to be the New York City depot. "The Pennsylvania Railroad's new station would be the city's greatest monumental gateway, the edifice where millions of commuters and travelers would surge off PRR and LIRR passenger trains" (Jonnes, 139). Both Cassatt and the architect McKim "cared deeply what…passengers would experience when they stepped forth into [the] new terminal" (Jonnes, 148). The decision to focus on the terminal with the railroad business as a primary feature came in order to preserve future options to expand the terminal or build future tunnels in the North River.

A large parcel that PRR had acquired was sold to the U.S. Postal Service in order to recover some of the very high land costs associated with the project. The logic was that PRR handled 40 percent of US mail and a post office facility, later the Farley Post Office Building, could be designed to interact with the tracks below. Another long awaited connection was

with the new subway lines, privately owned at the time. There was initially contention between Cassatt at the owners of these new private lines, but in the end a compromise was reached to bring them into the new station.

Building a grand entrance to New York City did not come cheap; the architect McKim proposed finishings including granite, and vast spaces hearkening back to the Roman Empire, comparing the rising American modern empire as "'nearly akin to the life of the Roman Empire than that of any other known civilization'" (Jonnes, 165). Although Cassatt balked at the cost associated with McKim's proposal, the finishings remained and Penn Station opened as a grand terminal in 1910.

4.1.1.1 Decline of Rail in the United States and the Demolition of the Original Penn Station

While the station itself was considered an architectural gem, its upkeep was expensive, particularly as rail travel declined regionally and nationwide with the growth of the automobile industry and air travel. Over time upkeep proved expensive, and the building was not well maintained. By 1960, railroads were carrying only 27% of all intercity passenger traffic, compared to 65% in the 1940s. By 1951 the Pennsylvania Railroad, which owned the station, was $72 million in debt and by 1955 the railroad sold the air rights over the station in order to save the company. New York City approved the demolition of the aboveground structure in 1961 and Madison Square Garden, a major entertainment hub and source of city revenue, was moved and developed on top of the station in the mid-1960s, where it has remained. Madison Square Garden was originally in Madison Square at 23rd Street and 5th Avenue in Manhattan. It was then moved to 49th Street and 8th Avenue before finally locating atop Penn Station. Figure 4-5 shows the previous locations of Madison Square Garden.

A 1963 New York Times editorial observed, "…until the first blow fell, no one was convinced that Penn Station really would be demolished, or that New York would permit this monumental act of vandalism against one of the largest and finest landmarks of its age of Roman elegance" (New York Times, 1963). The passenger railroad industry in New York City continued to be troubled, and in 1968, Pennsylvania Rail Road merged with the New York Central Rail Road in order to avoid financial collapse, but in 1970 the joint company Penn Central declared bankruptcy.

The bankruptcy of Penn Central led to new legislative and regulatory actions in order to save the railroad industry that was near collapse. Congress created Amtrak (known as the National Railroad Passenger Corporation) through the Rail Passenger Service Act of 1970 (Railpax). All railroads that operated passenger trains when Railpax was signed had to join

the NRPC by paying cash or contributing passenger equipment and services "based on half the road's passenger losses for the last full year of operation" in 1970, or purchase common stock in the new company (Kelly, 2001). Most railroads joined NRPC in order to relieve themselves of the burden of maintaining passenger service, but four did not and continued to operate passenger trains on their own. Amtrak's infrastructure came from these private railroads. Amtrak's preferred stock, which confers the only voting rights, is held by the USDOT while four railroads that contributed assets to Amtrak, APU (formerly Penn Central), BNSF, Canadian Pacific and Canadian National, hold common stock, which confers few benefits and no voting rights. It is not publicly traded, and "Amtrak does not produce any earnings or dividends, and does not convene an annual meeting of shareholders" (CBO, 2003).

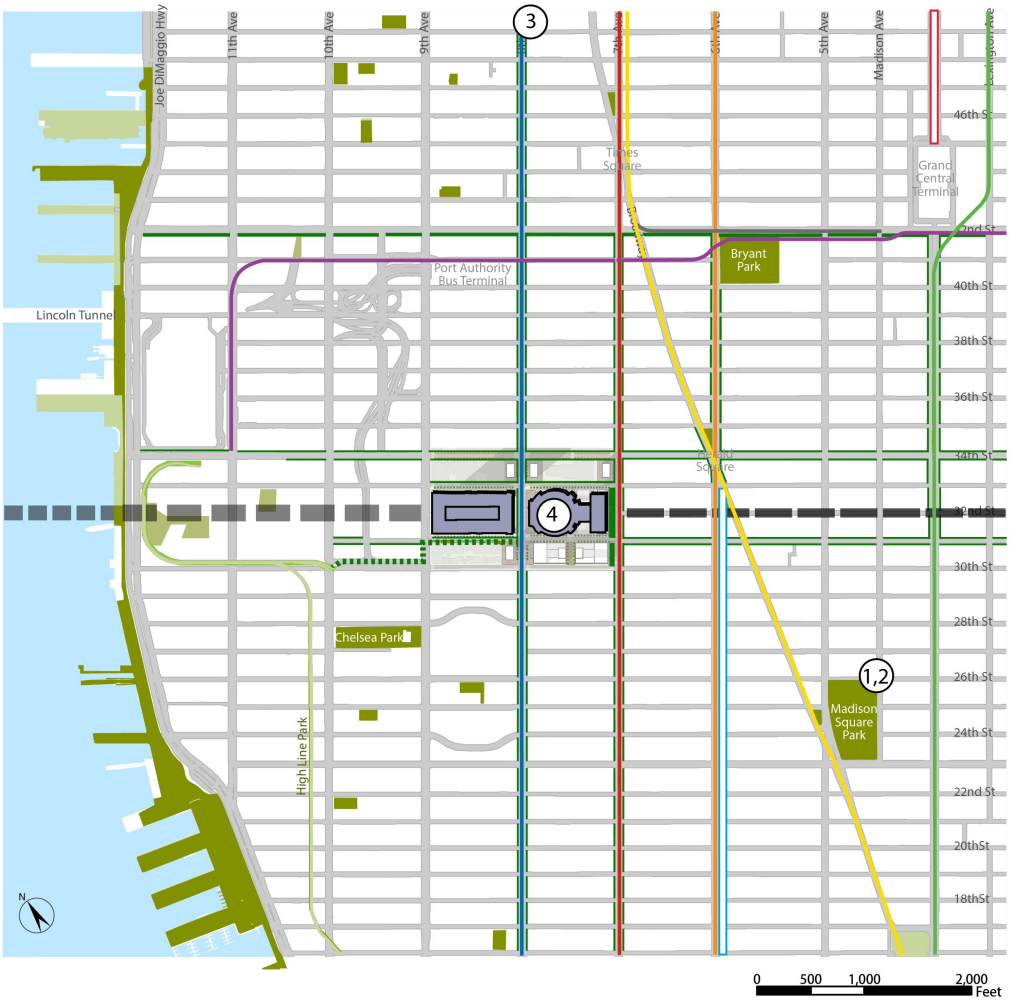

Figure 4-5: Previous Locations of Madison Square Garden. MSG is currently at 4, above Penn Station. Adapted from (Penn Station Planning Studio, 2013)

Penn Station was ultimately transformed from a grand station that celebrated rail into a cavernous maze difficult for commuters to navigate. The 1960s marked a period of growth for the automobile, and investment was transferred from rail and subways towards automobiles, highways, airports and suburban infrastructure. Its redesign was meant to serve intercity rail service that was seen in steep decline, along with the economy of the city of New York. The future was thought to be in the suburbs, but over time passenger rail service picked up and today Penn Station serves nearly 500,000 passengers daily on four rail services, a volume that the station was not designed to handle.

4.1.2 Increasing Rail Capacity Across the Hudson River

4.1.2.1 The Access to the Region's Core Project and its Cancellation

The Access to the Region's Core (ARC) project was designed to relieve the strain on the trans-Hudson transportation system by:

- Increasing trans-Hudson peak hour trains from 23 to 48
- Increasing peak hour passenger capacity by 35%
- Reducing the number of passenger transfers by 97%
- Producing an average travel time savings of 23 minutes

Governor Chris Christie cancelled the project shortly after taking office in October 2010, citing concerns about the potential cost overruns of the project. The U.S. Government Accountability Office's March 2012 report noted that there was no final agreement between the FTA and the State of New Jersey regarding who would be responsible for potential cost overruns . The project had already undergone a lengthy environmental review process in order to obtain government funds. About one third of the funding for the project was to come from a Federal New Starts grant, with another third coming from the PANYNJ. At the time of its cancellation, the expected cost of the project was between $9.8 to $12.4 billion, up from a 2009 estimate of $8.7 billion.

NJTransit, the MTA and the PANYNJ conceived the ARC project and these agencies undertook a joint Major Investment Study in 1995. However, at the time of its cancellation NJTransit was the sole agency on the project, with support from the FTA and the PANYNJ. The project was designed to best serve New Jersey commuters and ensure a connection to the New York City subway system on the Manhattan end. Designs were changed since the beginning of the project due to cost that meant the new tunnels would have only been connected to Penn Station via a pedestrian walkway, not through train tunnels. According to New Jersey Transit officials, this decision was made based on cost and based on the ultimate needs of commuters who require a subway connection but not necessarily connections to Amtrak, which they have in New Jersey, or LIRR.

The design of this project mean that tracks would not be able to be shared with Amtrak trains, but it would have doubled the capacity for NJTransit into Manhattan, allowing for 48 peak hour trains, instead of the 30 NJ Transit peak hour trains anticipated under Gateway.

4.1.2.2 HISTORY OF THE GATEWAY PROJECT

The Gateway program emerged in 2011 in reaction to the cancellation of the ARC project and in order to create capacity at the heart of Amtrak's railroad at its most severe bottleneck. The goal of the program is to double capacity under the Hudson River, shared between Amtrak and NJ Transit, and to improve the resiliency of the system and introduce redundancy into the system. The cancellation of ARC meant that both Amtrak and NJ Transit required now required additional capacity under the Hudson River.

While Amtrak has four mainline tracks along most of the Northeast corridor, there are only two tracks from Newark Penn Station to New York Penn Station. The infrastructure along this section of the line is very old and includes the New Jersey high line, as well as the Portal Bridge and Hudson tunnel. The bridge and tunnel need serious repair work, and both are planned to be replaced or renovated as part of the Gateway program. The program additionally plans to expand New York's Penn Station with new tracks to the south of the existing station.

Amtrak anticipates that major repairs will be needed in the existing Hudson River tubes by 2035, and that new tunnels are needed to add redundancy and reduce the impact of these repairs on the rail network. The Gateway Program is closely linked to Amtrak's plans for HSR in the NEC because additional capacity is needed to handle higher speed trains. Under current conditions (the condition of sections of track not withstanding), adding higher speed trains would reduce capacity on the line due to larger gaps needed between successive trains due to longer stopping distances. In order to accommodate future HSR, additional capacity is needed to address growth in demand, as well as the addition of this new technology.

4.2 ROLE OF PENN STATION IN NEW YORK CITY

Penn Station lies not only at the heart of New York City and the New York Metropolitan Area, but also at the heart of the Northeast Corridor, a mega-region stretching from Boston to Washington DC. The Northeast Corridor is an economic engine worth $3.75 trillion annually, enough to be the fourth largest economy in the world, behind only the United

States, China and Japan (Florida, 2014). The New York Metropolitan Area[4] itself had a projected gross metropolitan product of 1.42 trillion for 2014 (IHS Global Insight (USA), 2013).

Penn Station is located on the West Side of Manhattan between W 31st St and W 33rd St and between 7th and 8th Avenue. The station serves Amtrak, the Long Island Rail Road (LIRR), and New Jersey Transit (NJ Transit), as well as the A, C, E and 1, 2, 3 New York City subway lines. Studies are currently underway to address the feasibility of providing service from the Metro North Railroad into Penn Station. Figure 4-6 shows the transportation connections located near Penn Station, as well as distance buffers from the station.

The station is one of two major rail stations in the city of New York; the second is Grand Central Terminal, located on the East Side of Manhattan, currently serving only the Metro North Railroad and local transit services. A new capital project, East Side Access, is projected to open in 2022, and will bring some Long Island Rail Road trains to the East Side of Manhattan and Grand Central Terminal. LIRR still plans to serve both terminals; the service plans to either station have not yet been decided at the time of writing.

[4] The New York Metropolitan Area is defined as New York-Northern New Jersey-Long Island, NY-NJ-PA by the United States Conference of Mayors and the Council on Metro Economies and the New American City.

Figure 4-6: Transit Connections Near Penn Station. Adapted from (Penn Station Planning Studio, 2013)

4.2.1 Major Commuting Hub and Gateway to the City

Penn Stations sees over 450,000 users[5] every weekday, nearly twice as many as the country's busiest airport, and significantly more than its original design capacity of 200,000 (Previdi, 2013). The LIRR accounts for approximately 234,000 boardings and alightings, while NJ Transit accounts for about 168,000. Amtrak has about 31,000 daily users. More importantly, nearly 76% of all LIRR riders, 59% of NJ Transit riders and 72% of Amtrak riders board or alight in Penn Station (Real Transit, 2013). While Penn Station is the busiest rail station in the United States, its ridership is dwarfed by numbers such as those at Shinjuku Station in Tokyo, Japan, considered to be the busiest station in the world.

[5] The actual daily ridership at the station is unclear and estimates have ranged from 400,000 to over 600,000. This may be accounted for by the inclusion or exclusion of subway ridership to Penn Station. The station was originally designed to expect 200,000 passengers (New York State, 2016).

Shinjuku Station sees an average of 3.5 million people daily on 36 platforms and serves five rail systems (Railway Technology, 2016). Similarly to Penn Station, it is essentially a cluster of five stations, one for each system, and serves local, regional and intercity passengers. The busiest station outside of Japan is Gare du Nord in Paris, France, serving over 700,000 passengers per day also on local, regional and intercity systems using 44 platforms, but only 14 for commuter service. At Gare du Nord, most of the passengers are also commuters coming into Paris from surrounding suburbs (Bremner, 2015).

Table 4-1: 2008 Rail Ridership, Penn Station. (AKRF, Inc., 2006)

	Amtrak	LIRR	NJ Transit	Total
Annual Ridership	8.5 million	66.3 million	47.6 million	122.4 million
Daily (both directions)	30,730	233,360	167,750	431,840
Inbound (alighting)				
Peak period (6-10am)	3,005	86,980	56,697	146,682
Peak period (4-8pm)	3,430	9,110	11,175	23,715
Outbound (boardings)				
Peak Period (6-10am)	3,010	5,040	7,597	15,647
Peak Period (4-8pm)	4,530	73,520	46,901	124,951

Penn Station is a vital entrance to the city both for commuters, particularly from the rapidly growing ridership from Northern New Jersey, as well as for visitors to the city. Penn Station is Amtrak's busiest station nationwide, seeing 8.5 million annual boardings and alightings.

Rail is vital to the economic health of New York City and its region; over 75% of Manhattan workers rely on mass transit to reach their place of employment. Additionally, many of the region's workers live in suburbs or edge cities of the New York Metro Region, and travel into Manhattan or other parts of the city daily.

The Federal Reserve Bank of New York published a study of commuting patterns in the New York metropolitan area from 1980 to 2000 in the October 2005 issue of monthly publication, *Current Issues in Economics and Finance, Second District Highlights.* They concluded that throughout the New York metro region, commuters traveled farther and spend longer in transit than in the recent past. Additionally, while the monocentric commuting model is not as dominant as it once was, New York City is still the job center for the region (Bram & McKay, 2005).

In the New York region, Manhattan has long had the highest density of jobs, as well as the highest-paying jobs in the region, while the outer boroughs and surrounding suburbs have

benefited from the success through proximity. From 1980 to 2000, the number of workers commuting into Manhattan from outer counties remained almost flat, rising less than 5 percent over the 20-year period. In contrast, the number of works commuting to suburban counties in New York and New Jersey more than doubled. However, the absolute numbers of commuters into Manhattan continues to dominate the region. For example, there were 195,000 out-of-county commuters to Nassau County (on Long Island) in 2000, while there were 1.5 million commuters into Manhattan. Additionally, in 2000, 22 percent of working residents of Long Island, 19 percent of those in the lower Hudson Value, and 11 percent of those in northern New Jersey worked in Manhattan.

Figure 4-7: The vision for Hudson Yards. (Campbell-Dollaghan, 2014)

4.2.2 Anchor of West Side Redevelopment

The new Hudson Yards development, the future home of the headquarters of Coach, L'Oreal and Sidewalk Labs, is located one half mile west of Penn Station. Hudson Yards will be the largest private development in US history and much of the development is taking place on top of the existing West Side rail yards, owned by LIRR and used for daytime train storage (Campbell-Dollaghan, 2014). Figure 4-7 shows the vision for the Hudson Yards development. The area was rezoned in 2005, covering an area of 45 blocks. Much of the neighborhood is controlled by Related Companies, a major real estate developer in New York (Hughes, 2016). Over 17 million square feet of new development is expected at Hudson Yards, including up to 4,000 new residences, five office towers and 100 shops allowed under new zoning measures (Harshbarger, 2014).

While the development is centered around a new subway stop on the 7 line, Penn Station is the next closest stop and the easiest access to the new development for existing commuters. The new neighborhood is expected to add up to 125,000 new residents, employees and visitors each day once completed in 2024 (Hudson Yards, 2016). There are

doubts about the capacity of the subway and commuter rail systems to handle this new traffic (Harshbarger, 2014).

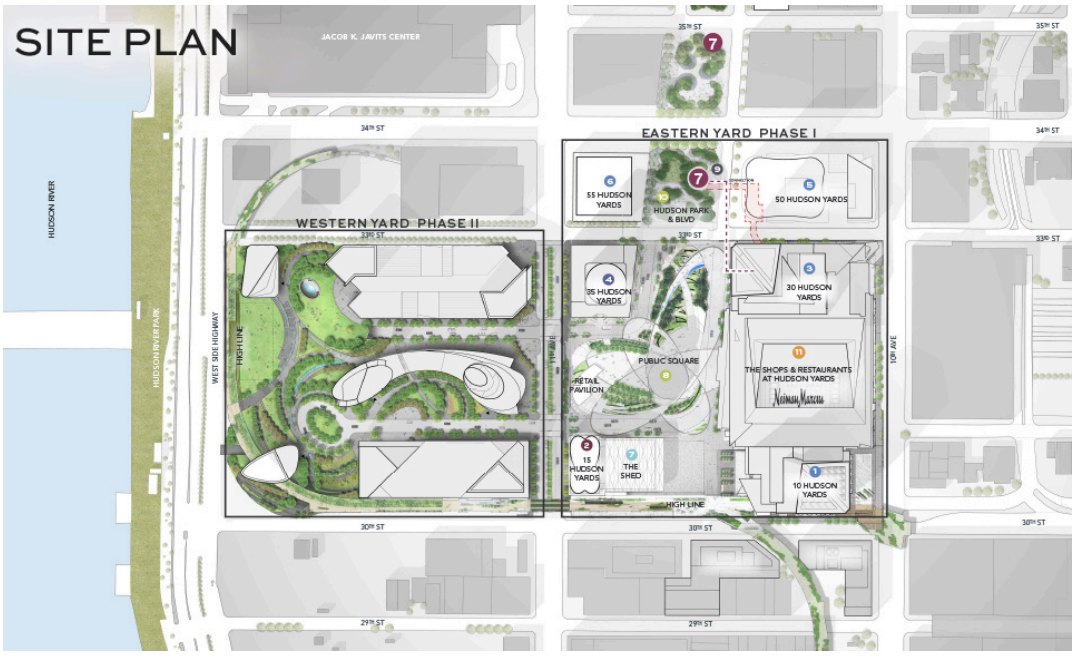

Figure 4-8: Expected site plan for Hudson Yards development. Phase I on the right, Phase II on the left. Penn Station and the future Moynihan Station located to the east of the site, out of frame. (Hudson Yards, 2016)

4.2.3 Major Challenges

Despite its position as a vital part of the regional economy, Penn Station has lacked the major investment necessary to improve the functionality, safety and experience of the station. It faces serious capacity constraints not only in its passenger concourses, but also in its track space.

4.2.3.1 Madison Square Garden

Madison Square Garden still sits on top of the station, but recently, future changes have come back into discussion. In September 2013, the New York City Council voted down MSG's proposal to extend its' special operating permit for perpetuity, and instead granted only a 10-year extension. This has opened up the opportunity to reimagine Penn Station and its role in New York City.

4.2.3.2 Station Layout

The existing layout at Penn Station treats each of the three operators as a separate entity, so the station essentially operates as three stations in one. Each operator, Amtrak, NJ Transit and LIRR have their own concourse, as shown in Figure 4-9.

4.2.3.2.1 PASSENGER CONCOURSES

Within these concourses, operators are responsible for their own signage and wayfinding, and rarely include information about the other operators in their station sections, making it very difficult to navigate the station. There are three separate information systems operating throughout the station and a passenger who may want to transfer from one operator to another would have a very difficult time finding information relevant to the other operator.

A source at LIRR noted that space at Penn Station is very divided physically, and that station improvements are also handled independently. This makes it difficult for passengers to know which party controls what, and has led to problems for the railroads in the past, particularly with regard to changes in restaurants and real estate. A third party, Penn Plaza, owns much of the retail space near the LIRR concourse, and they have replaced a number of retailers with higher-end shops recently. Many customers blamed LIRR for the closure of familiar retailers, despite their lack of control over this section of the station. She also noted that all the railroads are trying to make the station more upscale, but that many of LIRR's retail spaces do not do well due to the lack of passenger flow through their corridors.

Poor passenger circulation, as well as limited waiting space for passengers in each concourse is a cause of this issue. Navigating through Penn Station is difficult, and there is little space for passengers to wait, particularly because of how train platforms are announced. Passengers for all operators stand and wait for the announcement of which platform a train will arrive on, and then a rush towards the stairwells to board the train. The need for this system has been cited by officials at multiple operators as necessary due to insufficient waiting space on the platforms themselves.

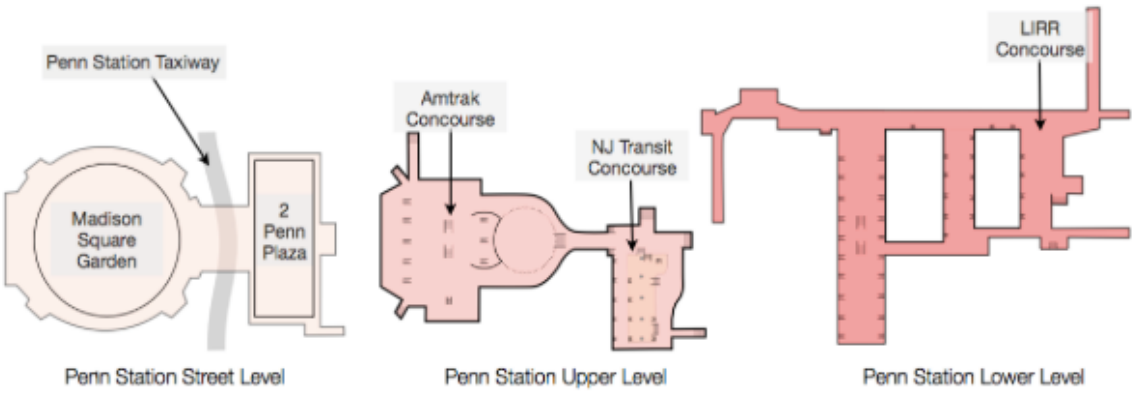

Figure 4-9: Current Concourse Layout at Penn Station (Real Transit, 2013).

4.2.3.2.2 TRACK ALLOCATION

Tracks at Penn Station can also only be used by particular railroads. As shown in Figure 4-10, tracks one through four, at the south end of the station, are used exclusively by NJ Transit, and tracks five through twelve are shared by Amtrak and NJ Transit trains. LIRR has the exclusive use of tracks seventeen to twenty one and shares tracks thirteen through sixteen with Amtrak. Except for the shared platforms, passengers cannot reach the LIRR tracks from the Amtrak and NJ Transit concourses and vice versa. This creates a potential barrier for increasing the capacity of the station by introducing flexibility into how track space is distributed. Additionally, a passenger from a NJ Transit train could exit into the Amtrak concourse or vice versa, without access to the section of the station they may have intended to reach.

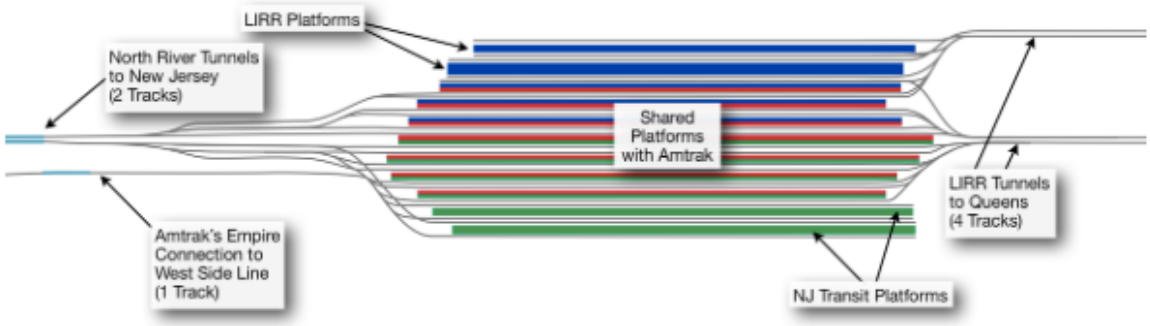

Figure 4-10: Penn Station Track Allocation Diagram (Real Transit, 2013).

The existing layout of the station has introduced constraints on both track capacity and ease of use for passengers. Many have said that Penn Station needs to add additional track capacity in order to ease congestion at the station, but Penn Station currently has 21 tracks operating very inefficiently. Other modern train stations around the world handle higher passenger capacities with fewer tracks due to more efficient track usage and a central control for all incoming trains. Paris' main commuter rail station, Châtelet-Les Halles, handles over 500,000 daily passengers with only seven tracks on four platforms (Levy, 2009). During peak hours, it can see up to 120 trains per hour. Châtelet-Les Halles is one of the busiest train stations in the world, and has managed to efficiently use its capacity through a combination of through-routing, efficient track layouts and by treating commuter rail more like rapid transit with short dwell times at the station.

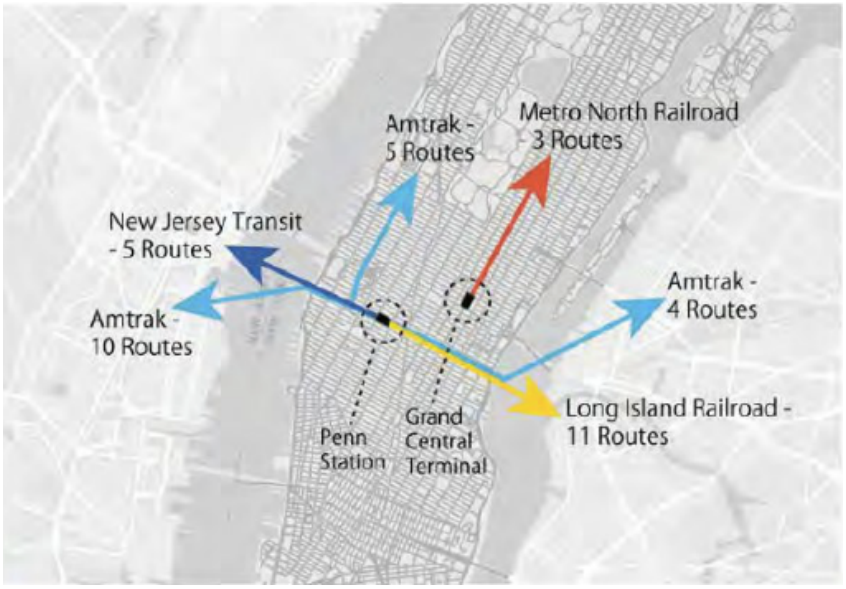

Figure 4-11: Regional Rail Connections in New York City: Penn Station, Grand Central Terminal and PATH.

Figure 4-11 shows the regional rail connections in Manhattan. The majority of regional rail operates out of Penn Station, but despite its proximity, it is difficult to transfer from one line to the next. Additionally, Metro-North has indicated a desire to run through Penn Station. While initially it was thought that the East Side Access to bring LIRR trains to Grand Central Terminal would open up capacity at Penn Station, LIRR has indicated that they have no plans to relinquish their current capacity at Penn Station. Given the existing constraints from track and concourse layout, there are few connections between LIRR and NJ Transit routes. Commuting trans-Manhattan is very rare, in no small part due to the bottleneck created at Penn Station, as well the lack of schedule and fare coordination among the operators. This limits development opportunities in areas outside of Manhattan since their potential worker pool is more limited.

4.3 The Future of Rail in the New York Region

4.3.1 High-Speed Rail and the Northeast Corridor

Bringing high-speed rail into the Northeast Corridor, shown in Figure 4-12, has potentially large implications for rail and rail infrastructure in the New York Metro Area. Penn Station is not only the busiest Amtrak station in the Northeast Corridor, as seen in Figure 4-13, it is also a potential chokepoint for rail service in the corridor due to insufficient capacity for growth in Amtrak service.

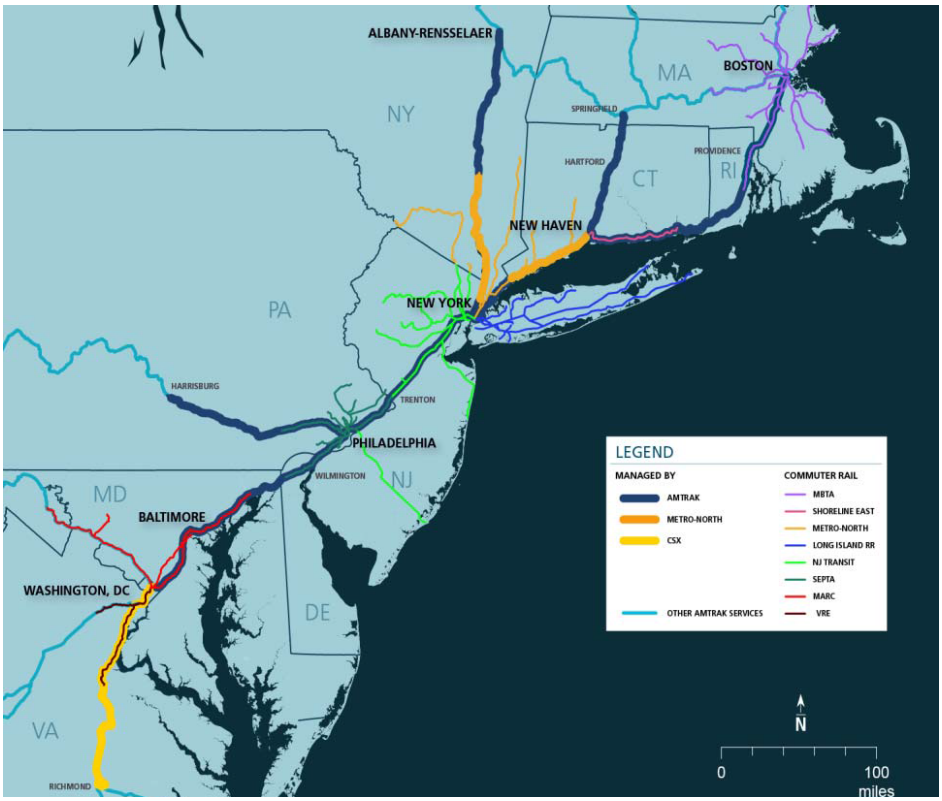

Figure 4-12: Map of the Northeast Corridor (Messick, 2015)

The Northeast Corridor consists of a 457-mile main line that stretches between Boston, MA and Washington, DC. It carries over 2,200 trains per day with 710,000 commuter rail, and 40,000 Amtrak passengers per day. Figure 4-13 shows the breakdown of daily train traffic on the Northeast Corridor. There are 8 commuter operators and 6 freight operators that travel on the NEC in addition to Amtrak. The corridor serves five major metropolitan areas, and one of every three jobs in the region are accessible from its transportation services (Tomer, Kneebone, Puentes, & Berube, 2011).

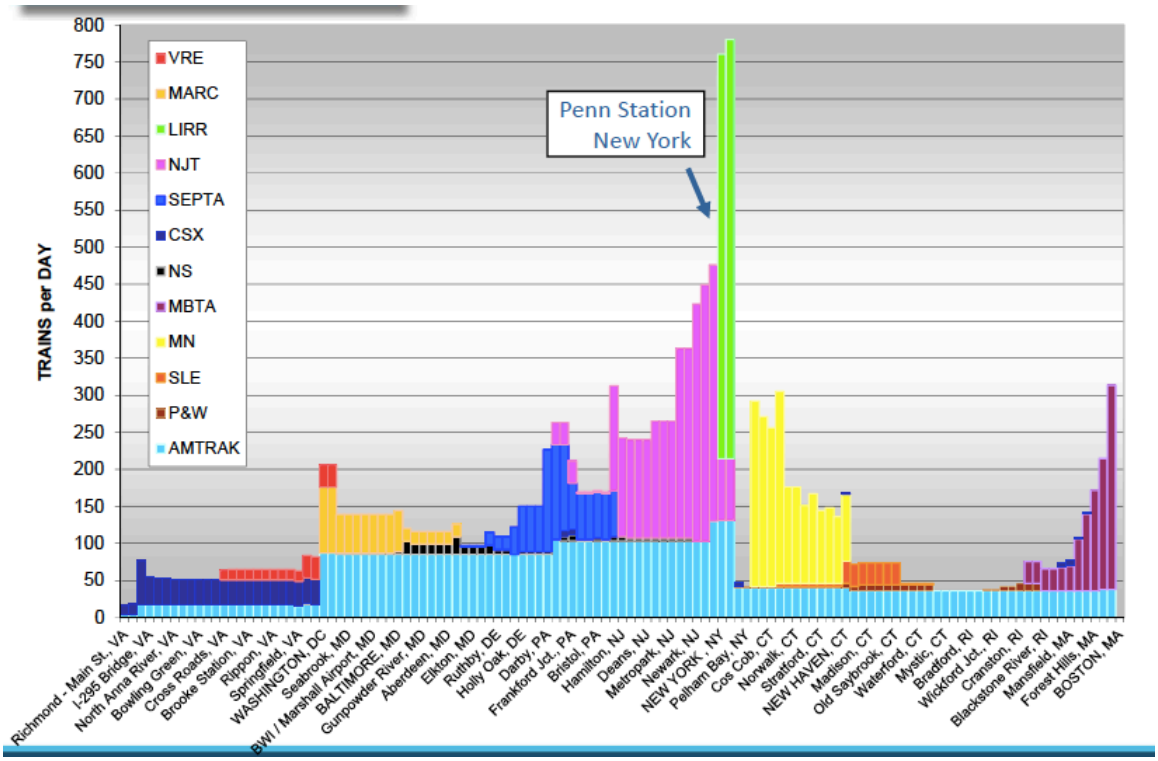

Figure 4-13: Weekday Train Movements on the Northeast Corridor by Amtrak station. (Messick, 2015)

A one-day failure of the NEC would cost the nation $100 million due to additional highway congestion, productivity losses and other transportation impacts (Northeast Corridor Commission, 2014). The corridor is currently experiencing record ridership, but the infrastructure along the corridor is deteriorating. Much of the NEC was built in the late 1800s and early 1900s, and much of the infrastructure along the corridor is in need of replacement or significant maintenance.

There are 13 owner/operators along the corridor. Amtrak operates from end-to-end, and owns much of the infrastructure, but there are 10 commuter rail authorities, as well as six freight operators that use the network for a portion of their service.

The commuter operators along the corridor are:

1) Massachusetts Bay Transportation Authority (MBTA)
2) Shore Line East (SLE) operated by Amtrak under contract to the Connecticut Department of Transportation (CDOT)
3) Metro-North Railroad (MNR)
4) Long Island Rail Road (LIRR)
5) New Jersey Transit (NJT)
6) Southeastern Pennsylvania Transportation Authority (SEPTA)

7) Maryland Area Regional Commuter (MARC) operated by Amtrak under contract to the Maryland Transit Administration.
8) Virginia Railway Express (VRE)

Amtrak owns the right-of-way between Washington DC, and New Rochelle, NY, and between New Haven, CT and the Rhode Island-Massachusetts border. The New York Metropolitan Transportation Authority (MTA) and CDOT own the New Haven Line, which is operated and controlled by MNR. The MBTA owns the right-of-way from the Massachusetts-Rhode Island border to Boston-South Station. Amtrak dispatches and maintains the right-of-way in Massachusetts under an agreement with the MBTA.

4.3.2 Reimagining Penn Station

4.3.2.1 Penn Station Vision

Penn Station Vision is a report completed by AECOM that was jointly commissioned by the MTA, NJ Transit and the Port Authority in order to re-envision how the space available at Penn Station could be used. While it was originally meant to be released in summer 2012, attempts to gain access to the report through personal connections and FOIA requests have proved unsuccessful. Some sources indicate that several of the transit agencies involved have tried to prevent the report's release. The report is meant to include indications of how passenger capacity can be increased at Penn Station given its current set-up, and some individuals involved have indicated that it may discuss the feasibility of through-running commuter rail service at Penn Station. Through-running will be discussed further later in this chapter.

4.3.2.2 Penn Station Access

Penn Station Access is an MTA project that would bring MNR service into Penn Station via existing right-of-way owned by Amtrak. It has been heralded as a project that would bring resiliency to regional rail, particularly important post-Superstorm Sandy, as well as providing other benefits including:

- Substantially reducing travel times for people living within the MNR service area and the West Side of Manhattan
- Provide new one-seat train service from the MNR New Haven Line to the West Side of Manhattan
- Provide transportation improvements at a low cost by using existing infrastructure
- Improve regional connectivity by brining MNR service into the same station served by Amtrak, LIRR, and New Jersey Transit
- Provide convenient and direct rail service to communities in the Bronx underserved by mass transit, while promoting economic development in the borough.

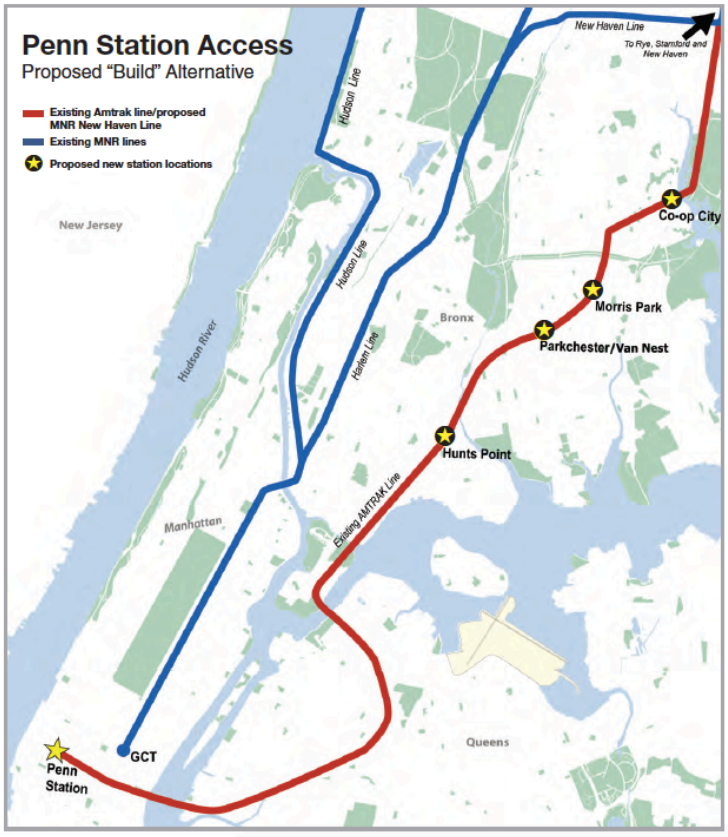

Figure 4-14: The Proposed "Build" Alternative for the MNR Penn Station Access project. Four possible new stations in the Bronx shown. Source: Penn Access, MTA

An initial draft Environmental Impact Statement for the Metro-North Penn Station Access project was prepared and released by Metro-North in September 2002. The goal of the report was to "examine the potential benefits, costs, and social, economic, and environmental effects of reasonable and feasible alternatives for improving access between the Metro-North service area, east of the Hudson River, and Penn Station and destinations on the West Side of Manhattan" (MNR, 2002). The project lost prominence for several years, but in the 2014 State of the State address Governor Cuomo delivered in New York, he strongly endorsed the Penn Access project.

The MTA 2015-2019 Capital Program indicated that the project would start after the completion of the East Side Access project, which is expected to divert over 50% of LIRR's existing passengers to Grand Central Terminal. The MTA, the parent agency to both LIRR and MNR, and the New York State governor have decided that bringing MNR service to Penn Station would have advantageous economic effects. However, adding another agency to the station further complicates the institutional relationships, as well as the physical constraints facing the station.

There remain questions regarding the pricing of new service from urban commuter rail stations. With service equivalent to that of the subway, many advocates have called for pricing to be equivalent to that of a subway ride. The New York City Council introduced legislation in November 2015 that would "allow city residents to pay a subway-equivalent $2.75 fare on the Long Island Rail Road or Metro-North within city limits, and transfer to the subway or bus for free", citing more efficient commuting for residents living in 'transportation deserts' in Queens and the Bronx (Whitford, 2015). The MTA stated, however, that it cannot justify the loss in revenue that such a fare adjustment would bring. According to an MTA spokesperson, the legislation would cost the MTA at least $70 million in lost revenue (Rivoli, 2015).

In December 2015, a passenger advocacy group, New York City Transit Ridership Council (NYCTRC), proposed a new fare group allowing for unlimited rail, subway and bus trips within city limits for $215 per month. Currently, a monthly transit pass and an LIRR pass for within city limits cost more than $330 per month. NYCTRC argues that this new proposal could help to reduce crowding on parallel subway lines, and help to increase transit access in transportation deserts in Queens. The MTA responded to the idea, saying it is "an interesting proposal" and that the authority will "consider it next year as we determine how to structure the next in our series of modest fare increases equivalent to the rate of inflation" (Harshbarger & Teirstein, 2015).

4.3.2.3 THROUGH-RUNNING

As indicated previously, it may be possible to relieve some of the congestion and capacity issues at Penn Station by rethinking how track space is organized and used. Through-running commuter rail service at Penn Station would involve New Jersey Transit or LIRR trains not using Penn Station as a terminal, but rather as a node in the system. There many possible configurations for through-running; NJT and LIRR could collaborate to run NJT trains until Penn Station and then have an LIRR take the train into Long Island. Alternatively, one operator could have new service that ran from New Jersey to Long Island or Westchester County, for instance.

Currently there is minimal sharing of track space and little schedule coordination among the operators at Penn Station. In addition, Penn Station acts as a terminal for both NJ Transit and the LIRR meaning that there are long dwell times and the need for trains to be turned around at the station. One proposal that has been put forth unofficially is to investigate the possibility of through running trains at Penn Station. This is currently being done on a small scale with the Meadowlands "Train to the Game", but has the potential to significantly increase the capacity of the station.

There are several examples worldwide of through running. One of the most successful is at Paris' Châtelet-Les Halles station, which serves nearly 500,000 commuter passengers – comparable to Penn Station - per weekday with only 7 tracks. The station serves 3 commuter lines and 5 subway lines. Unlike Penn Station, however, there is only one commuter rail operator, RER.

In its current configuration, Penn Station acts primarily as a stub-end station for commuter rail service; passengers are not able to cross the island of Manhattan from New Jersey to Long Island or vice versa and trains only pass to go into rail yards in Queens. Given the significant capacity constraints, through running at Penn Station would serve to share infrastructure and provide the ability for commuter services to run across the island of Manhattan, increasing efficiency and travel options throughout the region. Through-running may also open new business markets and economic development opportunities by changing the commuting shed for areas including Northern New Jersey and Long Island.

While through-running has often been discussed as a short-term solution to capacity constraints at Penn Station, there are broader long-term effects that through-running could have to open up new markets and enable economic growth[6]. The current constraints to this are primarily institutional; using through-running as a case to re-imagine the institutional landscape that governs Penn Station and transport in the region can help us understand the magnitude of impact changing the status quo may have. Projects such as the Gateway Program (two new tunnel tubes under the Hudson) or Penn South (additional platforms at Penn Station) would have a much larger impact on capacity, but may not have such large regional economic implications because they maintain the status quo in terms of travel patterns. Additionally, increases in capacity do not only represent the ability to add more trains to the station and corridor, but may also allow for improvements in reliability, speed and frequency.

There has been a successful experiment in through-running done at Penn Station in order to provide service on the New Haven Line from Connecticut to the stadium in the Meadowlands. This project involved using MNR personnel and NJT equipment running through tracks owned by MNR and Amtrak, but operated by the MTA and NJT. The MTA is contracted by MNR to run service on the New Haven Line. This service has shown that it is possible to orchestrate institutional cooperation, but that there are significant institutional barriers. Additionally, a constraint has been the lack of priority that Amtrak places on

[6] Suggested by individuals from the RPA. The railroads look at through-running primarily from a capacity perspective; there is little thought given to how one might change travel patterns or business location in the region and thus affect economic development.

these types of through-running service. The Sunday football service was designed to test out the feasibility of through-running because it may provide near-term solutions to the capacity issues that Penn Station is facing, particularly for commuter rail service.

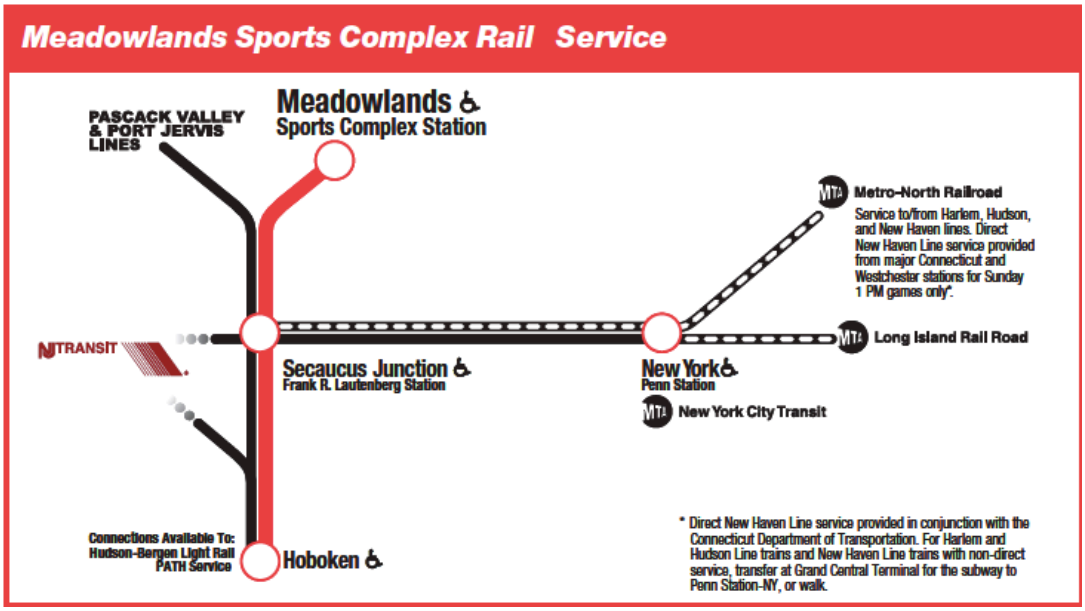

Figure 4-15: Meadowlands Sports Complex Rail Service. An example of through-running at Penn Station. (MTA, n.d.-b)

However, few see the current situation at Penn as a disaster or calamity, the types of events that typically spur government cooperation outside of the norm. Disasters such as Hurricane Sandy led to cooperation across state and agency lines that are typically difficult to manage. The level of cooperation that larger scale through-running or other major changes to the station would require is reliant on strong leadership and political will from the governors of both states in order to be feasible.

Many of the current proposals set forth to increase capacity at Penn Station and on the West Side of Manhattan involve expensive projects to build new tracks and station capacity without considering lower-cost solutions. Regionalizing commuter rail in this way will require more information on the suburb-suburb demand and has significant political implications.

4.3.2.4 Relocation of Madison Square Garden

When Madison Square Garden first occupied the space above Penn Station in 1968, rail travel was widely considered to be declining in importance in the nation's transportation sector. While Penn Station has reached its' capacity below MSG, the arena is currently the oldest in the NBA and NHL, and struggles to provide the modern entertainment experience that fans are looking for. In September 2013, the New York City Council voted down MSG's

proposal to extend its' special operating permit in perpetuity, and instead granted only a 10-year extension. While this does not guarantee that the Garden will be moving, it opens up opportunities to rethink Penn Station physical form as well as its role in Midtown and Manhattan, New York City and the region.

Figure 4-16: SHoP Architect's vision for a new Penn Station concourse (Alberts, 2013)

The Municipal Art Society, an advocacy organization in New York City, invited four high-profile architecture firms in 2013 to envision what Penn Station and its surrounding neighborhood could be were MSG to move (Alberts, 2013). The firms submitted grand proposals that focused on providing a grand entrance and concourse to the station and its surrounding neighborhood. None of the plans, however, delved into the physical complications posed by MSG at the track level. These projects, while primarily visionary, show what unconstrained futures might look like; however, there are very real constraints, particularly in funding, that do constrain what the future can look like.

4.3.3 Moynihan Station: A New Grand Station for Amtrak

Beyond these initial complications, Amtrak is preparing to move its passenger operations into Moynihan Station, one block west of Penn Station. This will free up terminal space within the station, but it is unclear what will happen to this space.

One project currently underway in order to relieve congestion in the existing Penn Station is to convert the Farley Post Office into Amtrak's new Manhattan home, to be known as Moynihan Station, in honor of New York Senator Daniel Moynihan, an advocate of Penn Station and expanded rail service in New York City. The Farley Post Office building is located across 8th Avenue from Penn Station. The first phase of the Moynihan project is currently underway and is expected to be completed in 2016. This phase consists of three major parts: creating access to tracks 5-21 at Penn Station from the Farley Post Office

building, expanding the existing corridor that will connect the new West End Concourse to the existing station including new subway entrances to the A,C,E subway station and installing a new ventilation system for the railroad platforms beneath the Post Office building (ESDC, 2014). The second phase of the project includes building a new train hall in the renovated Post Office building to be used exclusively by Amtrak. This phase does not yet have a timeline (Freemark, 2005b).

A transportation project manager for the Moynihan Station Development Corporation noted that one of the main motivations for the project is the limited vertical circulation at Penn Station. There is not currently sufficient waiting space on the platforms, which is unlikely to change, and so efficient movement of passengers to waiting trains is vital. The opening of Moynihan Station and movement of Amtrak passengers there was framed as one method to reduce the pressure on vertical circulation to platforms. It also allows for separation between intercity and regional rail passengers. The West End Concourse of the Moynihan Station will be complete in 2015, and will provide further access points to LIRR and Amtrak platforms. New Jersey Transit declined to be involved in the project, so the West End Concourse does not extend over their platforms.

Figure 4-17 shows a rendering of the Farley Post Office Building including the new West End Concourse, as well as the 33rd St connector between the two stations. While moving Amtrak's concourse and offices into the new Moynihan station opens up space at the existing Penn Station, it does not solve the existing track and tunnel capacity issues or the poor concourse layout of Penn Station. It also opens up questions of the ease of intermodal connections as passengers exit trains further from local transit options.

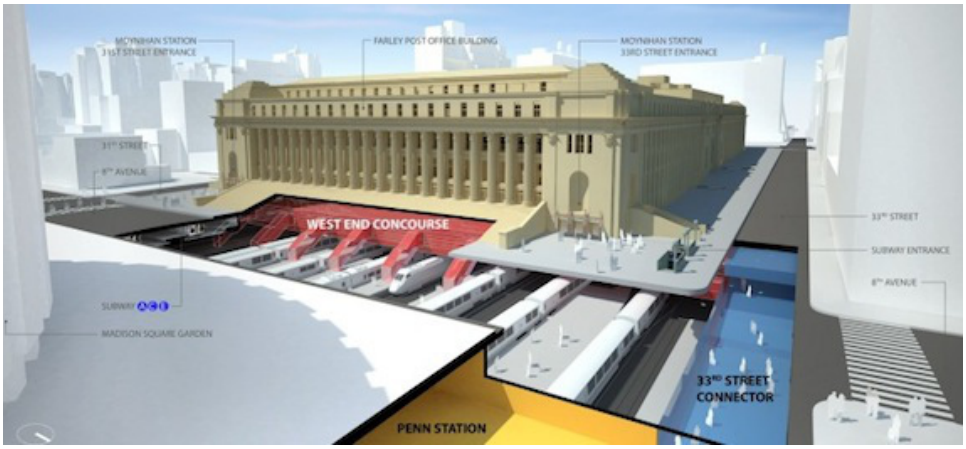

Figure 4-17: A View of the Farley Post Office building from the existing Penn Station. (ESDC, 2014)

4.3.4 GATEWAY PROJECT

Amtrak's Gateway Project aims to increase capacity and add redundancy to the existing tunnels by adding two new tracks under the Hudson River from the NEC line in New Jersey into Penn Station. The existing link tunnels under the Hudson are reaching their lifespan and will need perpetual service and eventual replacement. The new tunnels are meant to serve both New Jersey Transit, as well as future high-speed rail growth into Penn Station. This project was expedited in response to the cancellation of the Access to the Region's Core (ARC) project by Governor Christie in 2010.

The Gateway Project is expected to increase the rail capacity of NJ Transit into New York by 65 percent, or from 20 to 33 trains per hour during peak hours. The new track alignments, shown in Figure 4-18, will connect both to Moynihan Station, as well as a new Penn Station South adjacent to the existing Penn Station to accommodate the new tracks. Figure 4-19 shows the Gateway Project in its entirety, including new rail bridges in New Jersey.

The Gateway project is not only expected to increase capacity for NJ Transit trains, but for all operators, as shown in Table 4-2. Additionally, it is expected to increase the number of NJ Transit users with a one-seat ride to Manhattan, and also to establish Amtrak's new Moynihan station as a grand station and high-speed rail hub for the United States and Northeast Corridor.

Table 4-2: Increased Capacity for All Operators with Gateway Project (Messick, 2015)

Service	**Existing Capacity**	**Projected Capacity with Gateway Project**
Amtrak NEC trains/hr	4	12
Empire Corridor	1	3
NJ Transit	20	33
LIRR	37	38
Metro-North	0	6
Total Trains/hr	62	92

Figure 4-18: New track and tunnel alignment for the Gateway Project. (Amtrak, 2011)

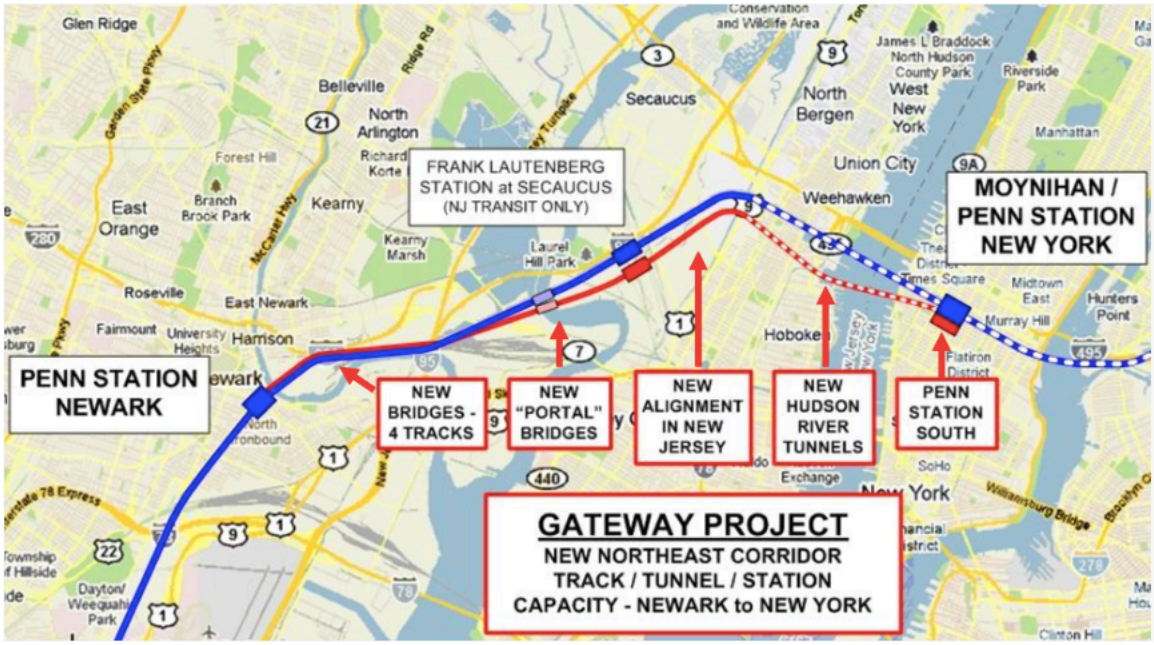

Figure 4-19: The Gateway Project. (Amtrak, 2011)

4.3.5 Empire Station Complex

In 2016, New York Governor Cuomo proposed redeveloping Penn Station, a project he called the "Empire Station Complex". The project incorporates aspects of both the Farley Post Office/Moynihan Station project, as well as the Gateway Tunnels. This announcement follows state-level commitment to funding for the Gateway project, but the proposal has been criticized for focusing on the aesthetic value of the station while shying away from

addressing fundamental physical limitations. A presentation released on January 6, 2016 states the three components to his vision as:

1. Redevelop Penn Station
2. Build a new train hall ringed by shops and restaurants at the Farley Building
3. Link the two structures into one, interconnected complex (Cuomo, 2016b)

This would require forming a joint entity between the Empire State Development Corporation, Amtrak, the MTA and Long Island Rail Road. The ESD, together with Amtrak, MTA and LIRR, released a new joint solicitation for Penn redevelopment on January 22, 2016. The terms of the RFP state that the new private developer will finance Penn Station redevelopment in exchange for retail development rights. It is unclear what happens to the existing space owned by Vornado within Penn Station.

5 INSTITUTIONAL ANALYSIS: IDENTIFYING GOVERNANCE GAPS

In order to understand and map the existing set of constraints and interactions between stakeholders, we must first describe the existing relationships and network, and then look at measures of effectiveness of governance. To describe networks, we will use elements from Rhodes' policy network analysis framework and Ostrom's institutional analysis and development framework. To measure effectiveness, we will look at measures of fragmentation and at Witbreuk's effective cooperation framework. The Ostrom model and policy network analysis are designed to understand and address complex governance challenges that may fall prey to free riding or tragedy of the commons (Ostrom, 2013). These frameworks and this thesis are based on the fundamental concept that organizational form and context affects decision-making and outcomes in policy networks. We will examine and map this structure and these gaps in the context of the Gateway Project discussed in Chapter 6. What led to the delay in decision-making? What are the challenges moving forward? What does this mean for Penn Station? Chapter 6 will apply these concepts to the case of Gateway and Penn Station.

By incorporating elements of Ostrom's and Rhode's frameworks with the elements of Witbreuk's hypothesis on effective cooperation, we will be able to begin to understand where decision-making breaks down in the New York region. Mapping the formal and informal relationships between actors will elucidate the complexity of governance in the region, and help to identify key relationships or links that become obstacles in regional transportation decision-making.

5.1 METHODS FOR DESCRIBING A NETWORK

The first portion of understanding the network is to map the relationships between stakeholders and understand what types of ties connect them, either binding them together or repelling them. Our ultimate analysis is built on concepts from the following two frameworks.

5.1.1 RHODE'S POLICY NETWORK ANALYSIS FRAMEWORK

A policy network focuses on government links with, and dependence on, other state and societal actors. According to Rhodes, "policy networks are sets of formal institutional and informal linkages between governmental and other actors structured around shared, if endlessly negotiated, beliefs and interests in public policymaking and implementation.

These actors are interdependent and policy emerges from the interactions between them". The actors involved include government, but also the private sector, civil service sector and others that bridge these fields. Policy network analysis is often used to understand international policy-making environments such as the EU; in the case of this thesis, the New York Metropolitan Area and Northeast Corridor are considered "internationalized" because of the presence of strong borders in the region.

Closeness of Relationships

Policy communities are generally tightly integrated, with a relative balance of power; not all members may benefit equally, but all see themselves as playing a positive-sum game. A policy community has characteristics including:

- A limited number of participants with some groups consciously excluded,
- Frequent and high quality interaction between all members of the community on all matters related to the policy issues,
- Consistency in values, membership and policy outcomes which persist and are stable over time,
- Consensus, with the ideology, values and broad policy preferences shared by all participants; and
- Exchange relationships based on all members of the policy community controlling some resources (Rhodes, 2008).

At the other end of the spectrum, McFarland (1987) defines an *issue network* as "'a communications network of those interested in policy in some area, including government authorities, legislators, businessmen, lobbyists, and even academics and journalists … [that] … constantly communicates criticisms of policy and generates ideas for new policy initiatives'.

Characteristics of issue networks include:

- many participants;
- fluctuating interaction and access for the various members;
- the absence of consensus and the presence of conflict;
- interaction based on consultation rather than negotiation or bargaining;
- an unequal power relationship is which many participants may have few resources, little access and no alternative.

Issue networks often disintegrate quickly; actors form alliances or groups to work on specific issues, but there is little staying power (Peterson, 2003).

Policy communities have more capacity to steer or control a policy agenda than issue networks.

The idea of policy networks links a micro-level of analysis, the understanding that interests and government play in specific policy decisions, and macro-level of analysis, the understanding of the distribution of power in society. Networks vary along a spectrum based on the closeness of the relationships in them (Rhodes, 2008). At one end of the continuum, with close relationships, are policy communities; at the other end are issue networks, with loose relationships between actors.

It is unclear whether tightly knit or loosely-constituted networks are more effective means of governance. Peterson (2003) notes that loosely constituted networks, such as issue networks, are "often more effective channels of communication than tightly-integrated policy communities", at least when thinking about the EU. The 'strength of weak ties' argument (Granovetter, 1973) is as follows:

> *In a world of cliques of tightly knit social circles, individuals are better off investing time in acquaintances (or 'weak ties') because it is through acquaintances that cliques are bridged and that information diffuses through a policy network…information communicated by strong ties – within-clique communication – will tend to be redundant, and will tend to travel short distances relative to the size of the network as a whole (Carpenter et al. 1998: 418–-9; see also Granovetter 1973).*

Information that only travels within a small network may not be able to as easily influence all the necessary actors to make a decision; it depends on who the key decision-makers are and where they fall within the network. Additionally, a culture of consensus supports the strength of weak ties argument. Generally in order to make decisions, governments must contend with a multitude of different interest groups looking to influence a piece of legislation or policy implementation. Some are considered outsiders with unrealistic demands, while others are insiders and are able to work closely with governments.

The American political system is made up of many smaller governments, or sub-governments. Ripley and Franklin (1981) define sub-governments as "clusters of individuals that effectively make most of the routine decisions in a given substantive area of policy". This is an important definition for our case because many actors are the sole or primary decision makers in their given policy area.

There are three basic assumptions necessary for policy network analysis:

(1) Modern governance is non-hierarchical; few solutions are imposed from the top down by public authorities. There is an interdependence between public and non-public actors, as well as different types of public actors.

(2) The relationships between government and other actors (and within government) vary depend on the policy area.
(3) While government (at all levels) are ultimately responsible for governance, policy choices are shaped by cooperation and bargaining between a diverse set of actors with diverse interests (Peterson, 2003).

The Rhodes model of policy networks has been used extensively to study governance in the European Union (EU). The EU is a particularly rich example because it is a unique polity, with no true government, or opposition, and its most powerful policymakers are not elected. It is extremely powerful in many respects, with its own system of law and the ability to affect a population of over 500 million, but it has few resources and depends heavily on the private sector. It is a true network of diverse actors (Peterson, 2003).

The Rhodes model highlights three key variables that determine the type of policy network that exists in a particular sector:

(1) *Stability*: do the same actors tend to dominate decision-making over time, or is membership fluid and dependent on the specific policy issue under discussion?
(2) *Insularity*: does the network exclude outsiders, or is it highly permeable by a variety of actors with different objectives?
(3) *Resource dependencies*: do network members depend heavily on each other for resources such as money, expertise and legitimacy, or are most actors self-sufficient and relatively independent of one another?

Policy network analysis allows for an analysis of governance, exploring the sharing of power between public and private actors. Governance is a broader term than government with public resources and services provided by any permutation of government and the private and voluntary sectors (Rhodes, 2008). We can use policy network analysis to determine what interests dominate decision-making and bargaining within a trans-border network. Two questions that can be asked in order to delve into this question are 1) how involved are politicians and senior public officials in decision-making on a certain policy issue, and how determined are they to impose their will, and 2) how much autonomy are regional ("supranational" in an international context) organizations given? Are they dependent on national, state, local or private actors for resources?

While American literature tends to focus on policy networks, European literature focuses more on interorganizational analysis, emphasizing the structural relationship between political institutions as the crucial element in a policy network, rather than the interpersonal relations between individuals in those institutions.

5.1.1.1 INTERPERSONAL RELATIONSHIPS

The formal relationships between institutions form only a portion of the relationships between agencies and actors. Informal and personal relationships between individual employees at organizations are particularly important in the very politicized and transient field of public transportation and governance. While the analysis of these relationships are outside of the scope of this thesis, the London School of Economics is exploring institutional capacity in New York City and other cities through their New Urban Governance project, results expected in Fall 2016.

5.1.2 OSTROM'S INSTITUTIONAL ANALYSIS AND DEVELOPMENT FRAMEWORK

The goal of Ostrom's framework is to focus "on the action situation leading to interactions and outcomes", as shown in Figure 5-1 (E. Ostrom, 2011). Figure 5-2 shows a higher level of detail in opening up the action situation to look at the component parts in order to analyze an individual actor at that level.

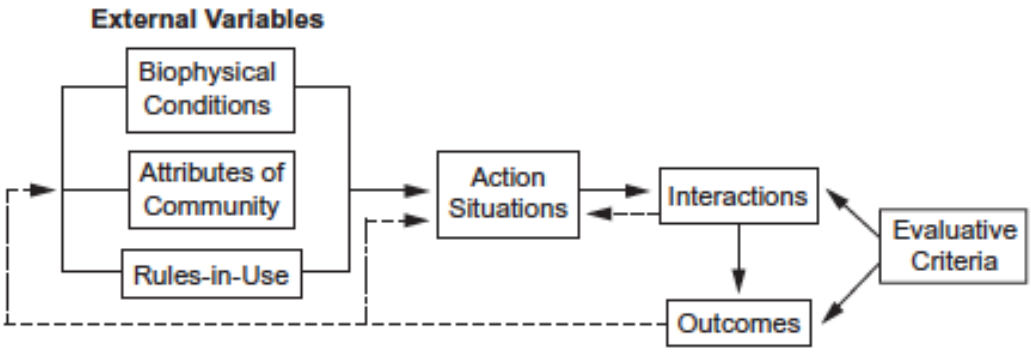

Figure 5-1: A Framework for Institutional Analysis. Adapted from Ostrom 2011.

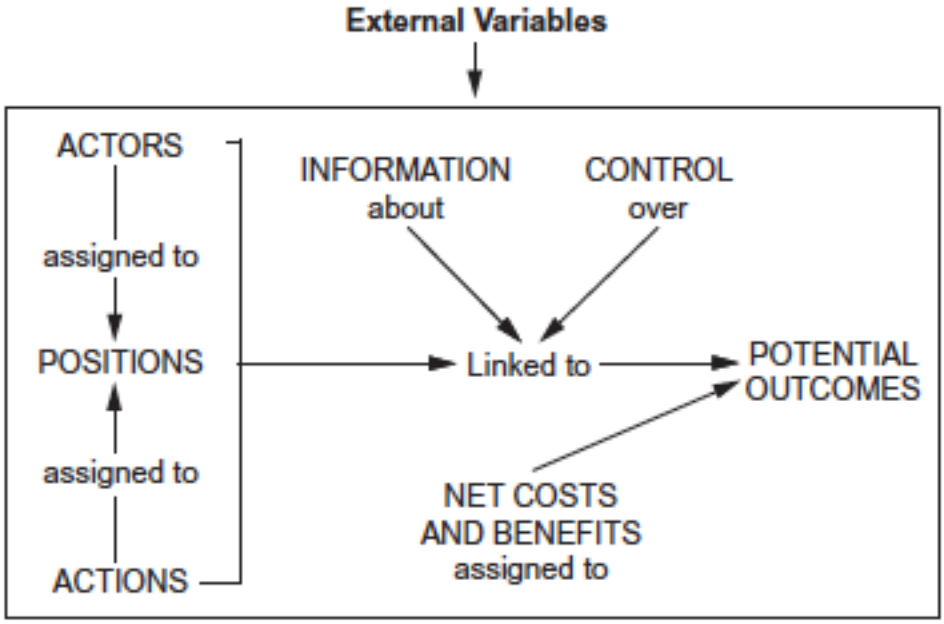

Figure 5-2: The Internal Structure of an Action Situation (E. Ostrom, 2011)

Key steps in utilizing this framework include (E. Ostrom, 2011):

1. Identifying an action situation that relates to behavior within institutional arrangements
2. Identify the set of actors
3. Identify positions to be filled by actors
4. Identify set of allowable actions (rules)
5. Identify potential outcomes that are linked to individual sequences of actions
6. Identify the level of control each actor has over choice
7. Identify the information available to actors about the structure of the action situation
8. Identify the cost and benefits (incentives and deterrents) of actions and outcomes

For a given action situation, there are resulting patterns of interactions and outcomes. Evaluating these outcomes gives further information about the source of a particular problem. Problems can be at the operational tier where actors interact influenced by the incentives that they face to generate outcomes; problems can also be present at the policy tier where "decision makers repeatedly have to make policy decisions within the constraints of a set of collective-choice rules" (E. Ostrom, 2011). Policy decisions can affect the structure of the situation; however, problems can be identified at an even higher level that affect who can participate in policymaking.

There are four key characteristics that are important to understand about a given actor:

1. The resources an actor brings to the situation;
2. The valuation an actor assigns to states of the world and to particular actions;
3. The way an actor acquires, processes, retains, and uses knowledge contingencies and information; and
4. The processes actors use for selection of a particular course of action (E. Ostrom, 2011).

5.2 Methods of Measuring Effectiveness

5.2.1 Measuring Fragmentation

Although fragmentation is ubiquitous in governance networks, there are few methods to map and measure it. Most attempts have been focused on the interaction between two formal regimes, or on anecdotal evidence to elaborate on characteristics and attributes of fragmentation. Having more actors does not necessarily lead to more complexity; fragmentation measures should control for size (Widerberg, 2014). Biermann et al. argue that the attributes of the communities and groups actors divide into are key for understanding the type of fragmentation present. Metrics should measure the distribution of edges across a network in order to understand whether there are institutions that have all of the connections, or whether connections are spread between nodes.

Two means of measuring this are average degree and centralization. Average degree measures how connected actors are on average; centralization measure the spread of connections in the network by measure the variance of a network as a percentage of a perfect star network of the same size (Hanneman and Riddle, 2005).

While fragmentation is often argued to be a negative characteristic of governance systems, there is some work, such as Peters (1996), that argues that fragmentation, networks, flexibility and responsiveness are all positive characteristics of flexible governance. The implications of these different structural characteristics have not been extensively researched.

5.2.2 Witbreuk's Effective Cooperation Framework

Witbreuk notes that there are several necessary conditions that have to be met in order to enable cooperation, as well as several variables that "influence the effectiveness of cooperation". These conditions include:

7. Situation interdependence;
8. Necessity of group effort for all stakeholders;
9. Ability to bear costs of cooperation; and
10. Stable environment.

Witbreuk uses a systems approach to look at cooperation. In his analysis, the environment is an external variable that offers both opportunities and limitations (Chisholm, 1989) and has to be relatively stable (Witbreuk, 1997). Both of these characteristics have to be true in order for actors to cooperate. The difficulty of setting up cooperation depends on "the size and severity of the problem". Urgency can help facilitate cooperation among actors, particularly if the problem is seen as solvable and cooperation is seen as useful (Chisholm, 1989). As cooperation develops, having rules to guide the cooperation can help to increase its chance for effectiveness and success. Each actor typically has "different (common and secondary) interests and usually will have different capabilities and resources". When the differences between actor's interests are larger, the harder it becomes to achieve cooperation.

Interaction informs reputation and trustworthiness, which plays a large role in determining cooperation. "Behavior in the past... will be used by the others to predict [the behavior] in the future. Reliable actors will seek one another [out] and find it more easy to cooperate". A stable group composition can help to build reputation as actors interact regularly. Unstable group composition can prevent the continuity and effectiveness of cooperation. The number of actors can also have an effect on the effectiveness of cooperation; small groups require less coordination and organization, and are less expensive to manage in terms of time. In a large group, free ridership is more attractive (Ostrom et al 1994).

Witbreuk outlines a theoretical model of cooperation, shown in Figure 5-3.

Witbreuk hypothesizes that effectiveness of cooperation is affected by 8 main factors:

1. Organization design rules
2. Seriousness/type of problem
3. Heterogeneity of interests
4. Size of group
5. Heterogeneity characteristics
6. Expected stability of group
7. Interaction between actors
8. Reputation

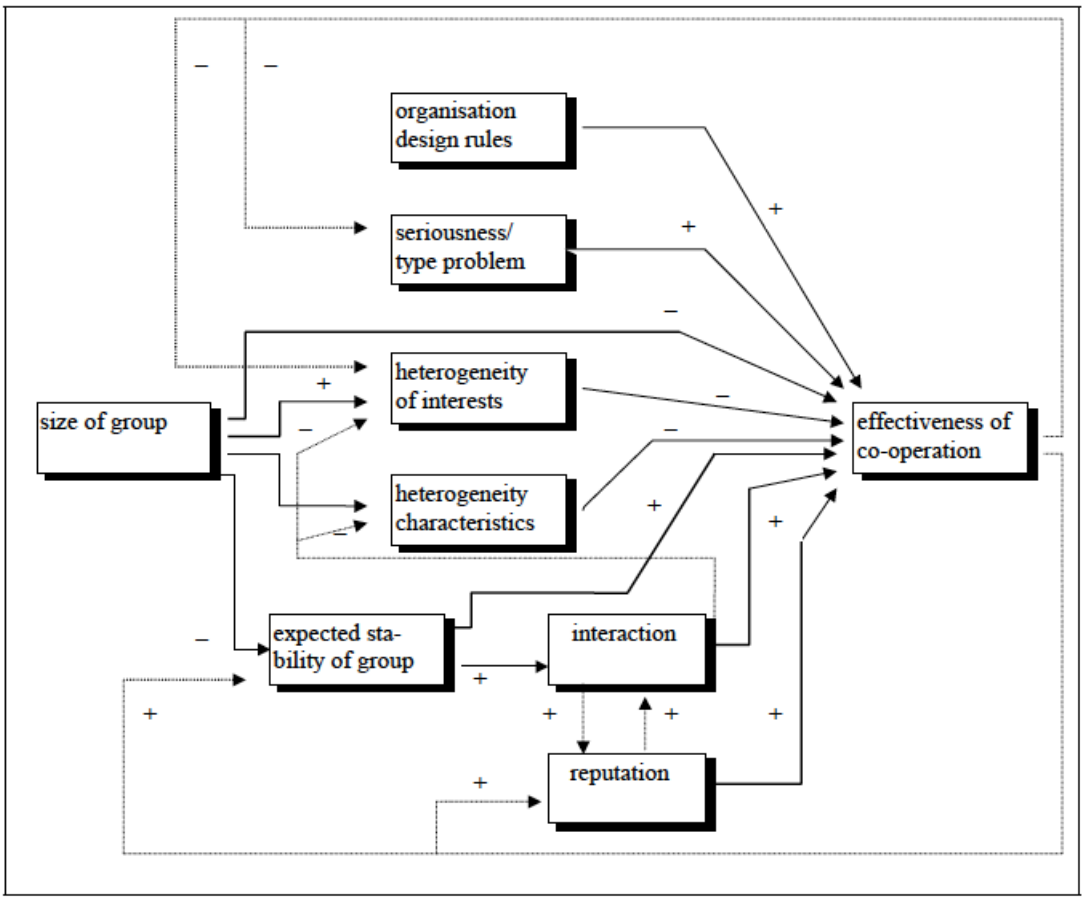

Figure 5-3: Witbreuk's theoretical model of cooperation

In order to test the theoretical model, Witbreuk operationalized the hypotheses in order to test them using three test cases in the Netherlands that met certain criteria:

- Experiencing comparable problems
- Of comparable size; and
- Comparable legal context.

It was important to look at these characteristics in order to limit the influence of other variables and allow the model to look at the influence of the environment as an external variable and organization of actors as an internal variable.

Reputation is a particularly important variable; it is difficult to measure but has enormous impact on cooperation. Witbreuk defines reputation as having to do "with the reliability and predictability of (behavior of) (representatives of) actors". It cannot be found in data or written sources, but rather often needs to be constructed through interviews and/or surveys. Witbreuk used the following items in his surveys, judged on a scale of 0% to 100%:

1. The other organizations are reliable (will not trick us)
2. In negotiations and discussions the other organizations are honest, frank and sincere.
3. The other organizations fulfill given promises properly.
4. The other organizations do not trust us nor each other and demand every agreement and promise to be put down in black and white.
5. The other organisations seem to forget certain verbal agreements wittingly.
6. Mutual confidence between the co-operating organisations is present.
7. Information the other organisations give is reliable.
8. The other organisations withhold information.
9. In case they will profit more, the other organisations deviate from made agreements and the common plan without consultation. (Witbreuk 2015)

The responses to these points were then used to determine the value of reputation. While Witbreuk did not differentiate between each organization that a respondent is judging, this author feels that it is important to answer for each organization separately. The equation below is modified to represent this change.
R_{ij} represents the mean reputation of organization *j* as perceived by respondent *i.* X_{ijk} is the response of respondent *i* to item *k* regarding organization *j*. w_k is the associated weight of each item. The weights should sum to 1.

$$R_{ij} = 1 - \sum_{k=1}^{9} w_k X_{ijk}$$

The mean reputation R_j of organization *j* by all respondents is:

$$R_j = \frac{\sum_{i=1}^{i} R_{ij}}{i}$$

Witbreuk has defined the dependent variable effectiveness of cooperation in several ways. He utilizes four indicators:

1. satisfaction of actors;
2. performance gap;
3. expected implementation of proposed measures; and
4. a weighted combination of all above indicators.

Witbreuk concluded that of the possible variables, there are several that have a large impact on the effectiveness of cooperation: interaction between actors, reputation, problem perception and perceived urgency of the problem.

Continued interaction is a necessary (but not sufficient) condition for the development and effectiveness of cooperation. Continued interaction implies that the future is important and that a relationship will continue into the future. The research found that an absence of communication has a negative impact on cooperation. Effective cooperation requires regular two-way communication between actors in both informal and formal settings. "These contacts have to be as directly, intense[ly] and regular as possible".
Reputation and interaction are related, as continued interaction continuously shapes reputation. An absence of cooperation in the past can have a negative impact on future attempts at cooperation.

Witbreuk also found that the perception of the problem at stake among actors is very important. If an actor does not perceive a situation as a problem, he or she is less likely to contribute to cooperation and continuous interaction with other actors. Among situations perceived as problems among all actors, solvability and perceived urgency become important. Urgency can help create cooperative environments.

Witbreuk found that in the Dutch case, municipalities in the peripheral areas of the studied regions were less likely to identify situations as problematic, despite common goals with respect to transport policy (improvement of accessibility and livability/safety). Witbreuk also notes the importance of other forces, particularly politicians that have influence over the administrative structure of government.

6 INSTITUTIONAL ANALYSIS AT PENN STATION

We have examined the spread of actors in the policy network surrounding Penn Station and the Gateway Project. In this chapter we will examine the positions of these actors, as well as their relationships with one another. The goal is to understand and identify the central and influential actors and their relationships, and identify where gaps or challenges exist in existing decision-making structures. We will begin by looking at the key actors and events in the region and then we characterize the relational context and highlight the gaps. We then examine recent developments in the policy process in light of this analysis. Following this analysis, we will outline some key recommendations and areas for further work in Chapter 7.

6.1 SUMMARIZING THE POLICY DOMAIN

While we focus on the main rail and political players in much of our discussion, there are seventy-four policy actors in our analysis of the Penn Station and Gateway Project domain; while there are likely many more that could have been included, these provide a good spread across organizational types, shown in Figure 6-1. While the majority of actors operating directly out of Penn Station are railroads, a broader set of actors was examined in order to understand the landscape and influences surrounding decision-making. Interviews were conducted with officials from all of the railroads, as well as a number of other civil society actors and academics familiar with the projects in order to understand how decisions are made and what these relationships look and function like in action.

Within the set of 73 policy actors examined broadly, twenty-six can be classified as 'local government'. This includes city and county governments from New York and New Jersey, as well as city agencies in New York City. 16 actors are from the state government level in New York, New Jersey, Connecticut and the broader Northeast Corridor, while 5 are from federal government and 5 are from regional organizations. Seven are transportation providers (many of which would also fall into the local or state government type), and the rest are from the private sector, civil society or are freight carriers.

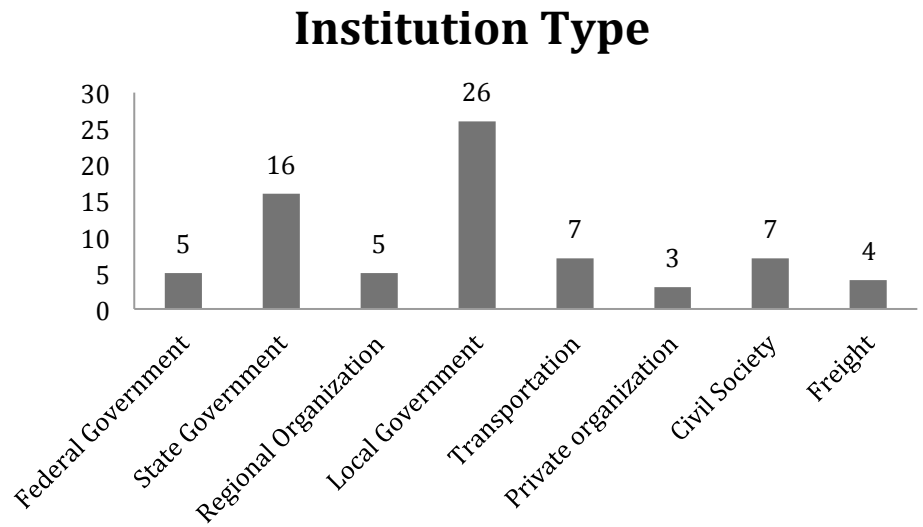

Figure 6-1: Policy actors in the Penn Station policy domain, disaggregated by organization type. N=74

There are many ways that groups of actors can be classified; geographic similarities, organizational structure similarities, organizational type similarities, and participation in the same policy events or regional membership organizations, among others. Figure 6-2 shows the formal connections between the main actors, showing directional relationships based on board make-up. It also indicates the divide of actors by geographic interest, with New Jersey on the left, New York on the right and regional and federal actors in the middle of the diagram. These distinctions show the complicated relationships in the region, but also the existing attempts to formalize advisory roles among actors and across geographic regions.

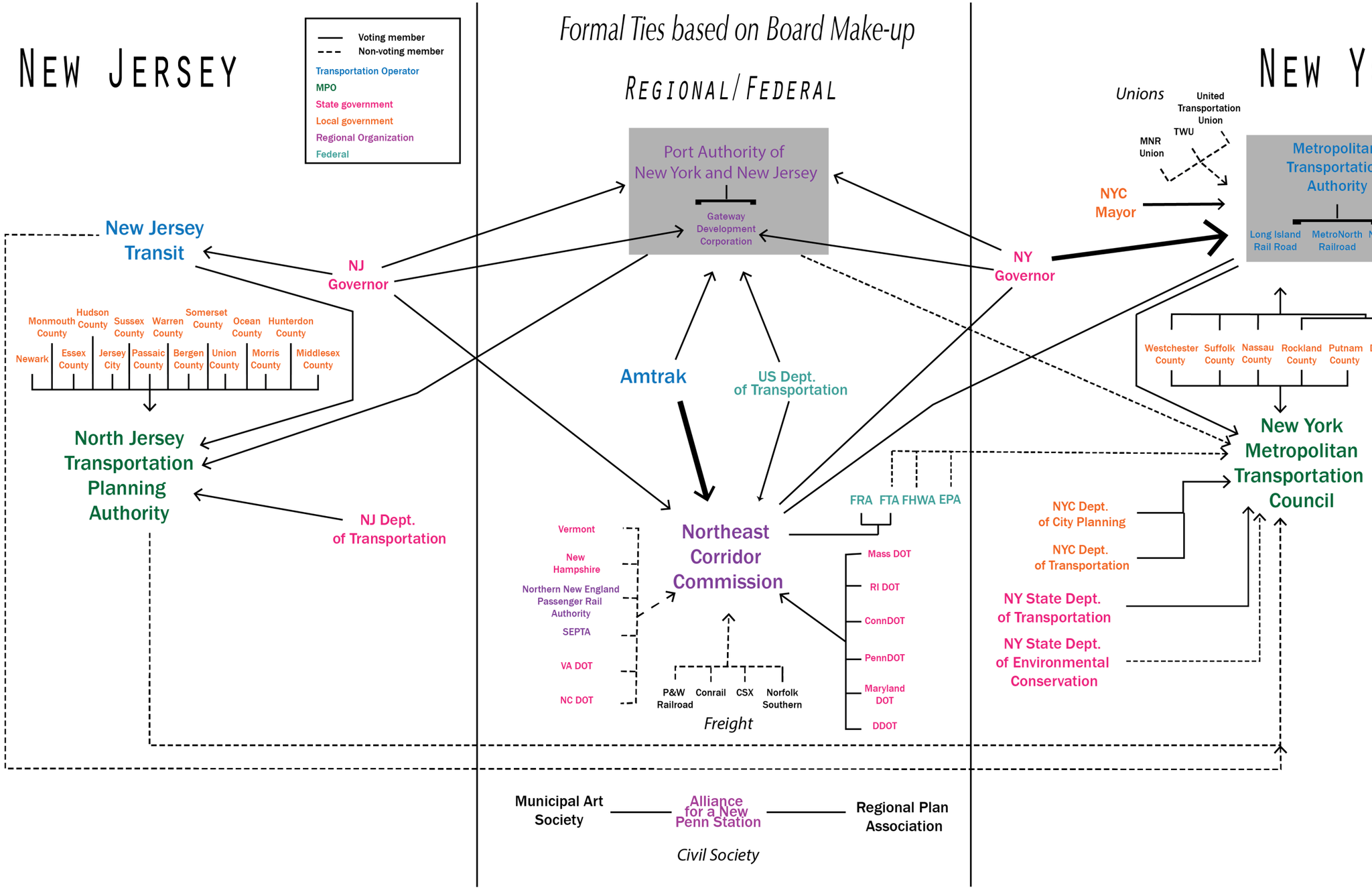

Figure 6-2: Visualizing formal connections among organizations.

6.2 CHARACTERIZING THE RELATIONAL CONTEXT: NETWORKS AND ACTOR POSITIONS

A few strong actors dominate policy-making in the New York metropolitan area on rail issues. There are many actors who have an interest in rail issues, and the strength of their interest can change over time and is dependent on the issue at hand. It has been difficult for stable networks to exist or persist because of the fluidity of interests and the extreme geographic focus of individual actors on their individual networks or constituencies.

Decision making on issues regarding Penn Station and the Gateway Tunnels are primarily the responsibility of the railroads, and the states of New York and New Jersey. The presence of a state border means both the States of New York and New Jersey are heavily involved, and they have been given authority by the federal government. While there have been attempts by the federal government to create institutional nodes to facilitate communication and exchange within the policy and decision-making network, these organizations (primarily the metropolitan planning organizations, NYMTC and NJTPA) have been given few resources and little independent power.

There is no real 'common' policy between the two sides of the Hudson River. Each state has its own policy regarding transportation, and it is highly decentralized. The transportation policy network is not independent or autonomous from their state level political masters. There is some horizontal configuration to the network, in that agency staff from both sides communicate, but ultimate decision-making is not up to issue experts at the railroads; the governors have the ability to intervene and often will. There is little formal vertical integration in which officials from different levels of government on the same issue interact to make decisions.

The presence of the state border means that there is little accountability. Amtrak owns the facility at Penn Station, but their responsibility is mainly towards their own intercity passengers despite controlling the access of other important regional systems. While the NEC is the most profitable corridor for Amtrak, they are required by the federal government to tend closely to corridors throughout the rest of the country and use profits from the NEC to cross-subsidized long-haul corridors that run at a loss. Headquartered in Philadelphia, Amtrak does necessarily have the same institutional prioritization of Penn Station as the railroads for which it is their main hub.

In this section, we will first discuss the organizational positions and stakeholder typologies of key stakeholders, before moving into a discussion of institutionalized venues for

collaboration, key policy events and reports. Section 6.3 will discuss the relationships among the different stakeholders.

6.2.1 Identifying Central Actors and Building a Stakeholder Typology

Through conversation with representatives from regional stakeholders, it is clear that the most powerful actors in this policy domain are **Amtrak** and the **Governors of New York and New Jersey**. They have the most independence and do not rely on other actors for resources to a large extent. The **USDOT** and **Congress** are also important and powerful actors.

One method for formally understanding the dynamics between actors is to look at stakeholder typology and salience, a theory coming out of business and management literature (Mitchell, Agel & Wood, 1997). This theory posits that actors can be differentiated on three characteristics – power, legitimacy, and urgency, and then categorized based on these attributes. The attributes are defined as follows:

- **Power** is the ability of a stakeholder to impose its will in a relationship (Mitchell, Agel, & Wood, 1997). It is the ability of a stakeholder to influence another actor to do something that they may not have otherwise done. Power gains authority through legitimacy and it gains impetus through urgency (Moody, 2016).
- **Legitimacy** is the generally perceived assumption (by others) that a stakeholder has a proper claim within a relationship. Legitimacy can come from contractual or legal rights (such as through land ownership or a written contract), or through moral interests (such as human rights or environmental justice). Legitimacy is dependent on individually-, organizationally-, or socially constructed system of norms, values, beliefs and definitions (Moody, 2016).
- **Urgency** is the degree to which stakeholder's claims call for immediate and pressing action. This is a function both of the time-sensitivity of an issue *and* of whether the stakeholder considers the issue to be of vital importance (Moody, 2016).

In the case of Penn Station and the Gateway Project, we can look at these attributes based on the relationship the actor has with decision-making and changes at Penn Station and in the development of the Gateway Project, seen in Figure 6-3. While we previously examined a set of 73 actors, we have highlighted only the most relevant in this diagram.

There are different questions that are important to ask for different types of institutions. For governmental bodies, it is important to consider what mandate they are under due to conditions of their creation, as well as the extent of their constituencies. For regional organizations, it is important to consider what administrative responsibilities they may have, what they are empowered to do, and why they were originally created. For private

companies, it is important to consider what the makeup of their board is, as well as how they stand to profit. For civil society organizations, it is important to consider how far they can step. Each actor has geographic interests, and is beholden to a particular audience due to financial or political constraints.

It is clear from the stakeholder typology diagram that there is a lack of power in the institutional sphere; there are few stakeholders who have the ability to impose their will in a relationship. Those that do are few and do not always represent the majority of travellers at Penn Station or of the entirety of the metropolitan region. This vacuum of power makes it difficult to move forward in a way that addresses regional needs with the type of massive infrastructure improvements and investments needed for projects such as Penn Station and the Gateway Program. If a definitive stakeholder, such as USDOT, Amtrak or the State of New Jersey, does not value a given project, or value the involvement of other less salient stakeholders, then a project may be put on hold. Table 6-1 further describes the positions and attributes of key stakeholders.

While the stakeholders were discussed in Chapter 3, we will explore further their specific interests with regards to Penn Station and the Gateway Program, as well as the relationships between them.

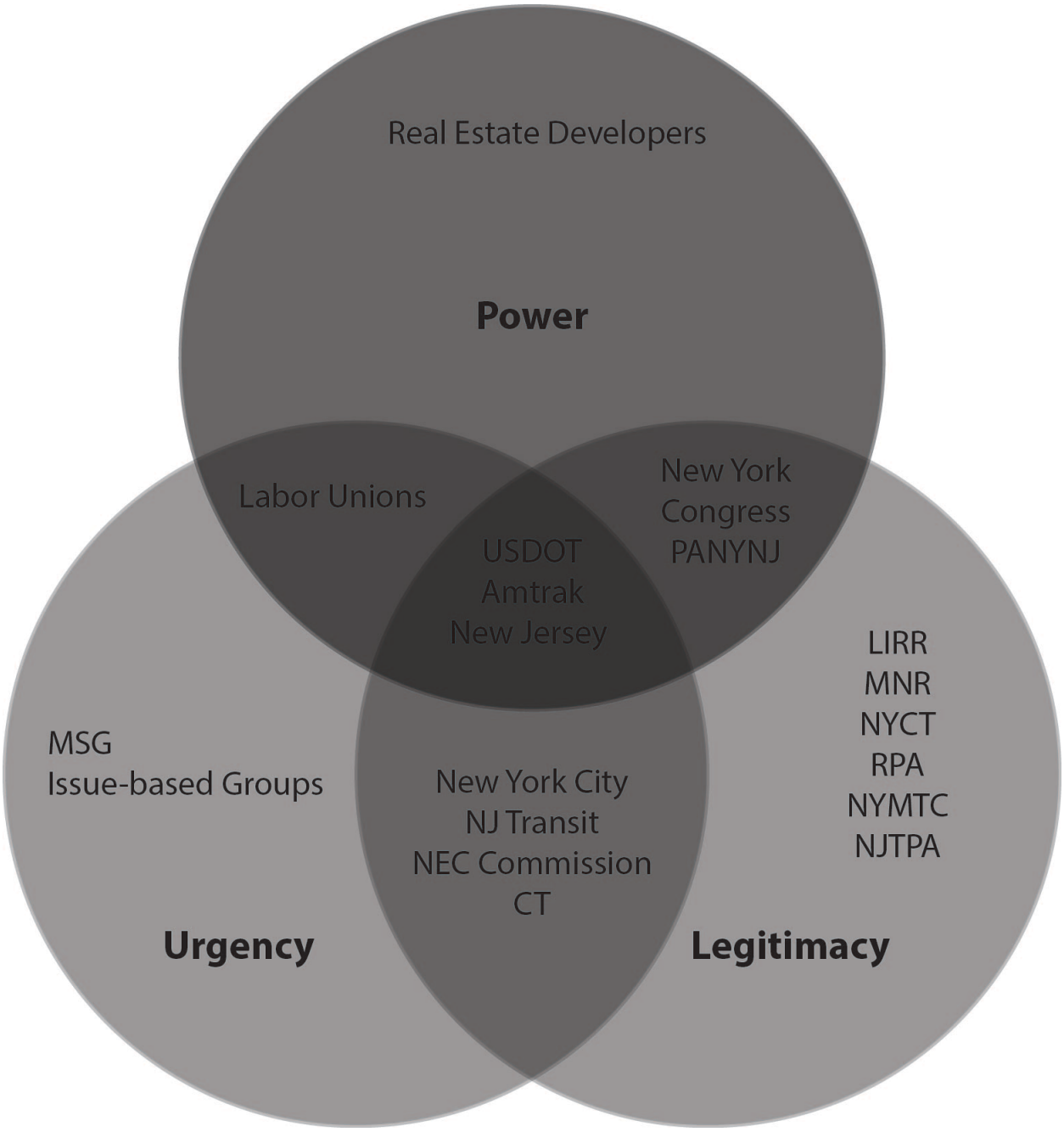

Figure 6-3: Mapping the Power of Stakeholders Using a Mitchell Framework

Table 6-1. Assignment of stakeholder typology characteristics and types to actors involved in Penn Station and the Gateway Project (adapted and expanded from Moody, 2016).

Government / Public Sector				
Actor	**Power**	**Legitimacy**	**Urgency**	**Type (P L U)**
Congress	√ Controls all federal legislation and funding (including budget for DOT and allocations for Amtrak).	√ Authority given by the U.S. Constitution and the mandate of the electorate.	X Glacially slow to act and the issue of HSR/transportation is only one of many being considered. Have eventually made commitments to help fund the Gateway Project due to the impact on the national economy.	Dominant (P L 0)
State of Connecticut	X Controls all legislation and funding on the state level; however, Connecticut does not run the rail lines that come through the state and are not involved in the other decision-making organizations in the New York Metropolitan area. Much of the control of the MNR lies with the MTA despite its physical presence in CT.	√ Authority given by the mandate of the electorate.	√ MNR service to Penn Station would have a positive impact on the state of CT, but commuters do already have access to NYC. Not solely focused on HSR or Penn Station.	Dependent (0 L U)
State of New York	√ Controls all legislation and funding on the state level; however, any projects with matched federal funding must	√ Authority given by the mandate of the electorate.	X Not focused solely on the issue of HSR, but have a slightly more immediate stake than Congress. Would be most	Dominant (P L 0)

	conform to all federal regulations. Governor controls the MTA, giving them significant power over operations and decision-making.		focused on the interests of state commuter rail and highway agencies. Have to balance interests of New York City and constituents in the more rural parts of upstate New York. The governor has been slow to support Gateway, but has been more active on the redevelopment of Penn Station and Moynihan Station through the state economic development arm.	
State of New Jersey	√ Controls all legislation and funding on the state level; however, any projects with matched federal funding must conform to all federal regulations. The Governor has ultimate power over the transportation network as shown through the cancellation of the ARC project.	√ Authority given by the mandate of the electorate.	√ Not focused solely on the issue of HSR, but have a slightly more immediate stake than Congress. Would be most focused on the interests of state commuter rail and highway agencies. The current governor (Chris Christie) has a history of not supporting public transportation projects, particularly after the cancellation of the ARC project. The project is urgent for NJ commuters but not necessarily the governor.	Definitive (P L U)
City of New York	X Oversee local legislations, regulation and taxation, but have few resources compared to the	√ Voting public elects officials to address local needs; has the authority	√ Local and urban transportation issues are of vital and immediate importance,	Dependent (0 L U)

	federal or state levels; have no authority over a project because of the control of the MTA by the State and of Penn Station by Amtrak.	to administer some programs funded by the state or federal government as well as regulate public utilities (including transport access). The City has little control over the local or metropolitan rail systems, however. Access to Penn Station has an impact on the local economy.	especially concerning whether a region or city is served by the proposed HSR alignment and connectivity to urban public transportation organizations. Penn Station and access to the City has a significant impact on the City's economic well-being.	
Counties in the New York Metropolitan Area	X Oversee local legislations, regulation and taxation, but have few resources compared to the federal or state levels; have no authority over a project as large as intercity/interstate HSR, but sit on the boards of regional transportation operators.	X Voting public elects officials to address local needs; has the authority to administer some programs funded by the state or federal government as well as regulate public utilities (including transport access).	√ Local and urban transportation issues are of vital and immediate importance, especially concerning whether a region or city is served by rail. In the New York region connections to New York City are particularly important given its status as an employment hub.	Dependent (0 0 U)
USDOT	√ Have power in many areas of transportation in the U.S. including regulation, legislation, research and statistics, policy initiatives, and allocation of grant resources. Have some power to bring governors and Amtrak to the	√ Cabinet-level department in the US government with secretary appointed by the President.	√ USDOT has identified improvements to the NEC (and HSR development) as a strategic goal for a new transportation system to promote continued, national economic growth. Penn	Definitive (P L U)

	table.		Station and Gateway are critical components of any future HSR program given the current limited capacity for growth in service. Secretary Foxx has called the projects urgent. Failure of the existing Hudson River tunnel would have national economic consequences.	
Amtrak	√ As primary owner of track along the NEC and of Penn Station, Amtrak controls intercity passenger operation and infrastructure upgrades to existing lines; however, is dependent on large government subsidies for other services.	√ Created in 1970 by the Rail Passenger Service Act to provide all national passenger rail service; it is incorporated in DC and subsidized by the federal government. Amtrak has a relatively weak reputation however, and has changed management structures many times. As the only intercity rail operator, and the owner of Penn Station and other infrastructure along the NEC, they have legitimacy.	√ As both the infrastructure manager and sole intercity operator on the NEC, HSR development is of vital importance. Changes to Penn Station to accommodate HSR growth are particularly important for Amtrak. Many of these changes are also vital for NJ Transit, which is of less importance to Amtrak.	Definitive (P L U)
NEC Commission	X Determine and allocate costs, revenues, and compensation among Northeast Corridor (NEC) owners and operators, but have no	√ Created by Congress to address system improvement planning for the NEC; have many	√ Small-scope institution focused on improving traffic flow on the existing NEC rail infrastructure. Hired by the	Dependent (0 L U)

	significant finance or policy leverage.	other stakeholders as members.	FRA to propose new HSR development and carry out the EIS. The alignment that runs through Penn Station is subject to new cost-sharing schemes, and is of importance to the infrastructure owner (Amtrak) and to the leasers. Urgency is created through mandates and deadlines.	
PANYNJ	√ PANYNJ is self-supporting: they own land and set usage fees for their infrastructure. The PANYNJ operates key infrastructure – including bridges, shipping and railroad terminals, and airports – in the region. The PANYNJ has also been tapped to house the new Gateway Development Corporation (GDC), which is intended to lead construction of the new Hudson River Tunnels.	√ A board made up of representatives from New York and New Jersey governs the Port Authority. They have explicit powers codified in law.	X Port authorities have many pressing concerns regarding existing infrastructure (particularly bridges and airports) along the corridor and therefore early-stage plans for changes to Penn Station or HSR may take a backseat. It is unclear what the urgency on the creation of the GDC is on the part of the PANYNJ.	Dominant (P L 0)
Gateway Development Corporation	X The GDC has not yet been implemented within the PANYNJ. It is in charge of constructing the Gateway Tunnels, but has not been empowered with other responsibilities at this time.	√ As part of a bi-state agency, it in theory will have legitimacy. Concerns have been expressed from the New Jersey side that their interests will not be well represented.	√ The Gateway Project is urgent. This organization will have urgency to complete the construction before the existing tunnels fail.	Dependent (0 L U)

New Jersey Transit	X New Jersey Transit has little power in the alignments leading up to Penn Station. They own Newark Penn Station and Secaucus Junction, but do not own infrastructure crossing the Hudson or in Penn Station. They do not control the dispatching of their own trains into Penn Station.	√ Access to Penn Station and ultimately NYC is a top priority for NJT. They are the primary user of the Hudson River Tunnels.	√ The poor maintenance of the existing Hudson River tunnels will have the biggest impact on New Jersey Transit and their customers. One proposal is the need to operate only one track across the Hudson, reducing capacity by 75%. NJ Transit would have significantly fewer slots than they currently have and would be secondary for access to Amtrak.	Dependent (0 L U)
MTA - Long Island Rail Road	X At Penn Station, LIRR has more power than NJ Transit due to the favorable timings of their agreements with Amtrak. However, they still do not have a controlling interest.	√ Primary user of Penn Station, but only secondarily affected by the Hudson River Tunnels.	X Infrastructure across the East River is in better shape than across the Hudson. The Gateway Project will have little impact on LIRR's operations. They are currently completing East Side Access, which will increase their capacity.	Discretionary (0 L 0)
MTA - Metro North Railroad	X MNR currently does not access Penn Station, but there are proposals for service on the New Haven Line to come into the station. The governor is pushing for this service, but MNR currently has little stake or power.	√ Do not currently have a stake at Penn Station, but have an interest in the future of the station and the possibility to connect MNR to the west side of Manhattan.	X Changes to Penn Station may help to accommodate MNR service in Penn Station. The railroad does not seem to have this project as an urgent project, but it seems to be urgent for the governor of New York.	Dependent (0 L U)

MTA – New York City Transit	X NYCT has no jurisdiction over Penn Station or the Gateway Project.	√ Changes at the station and potential changes in passenger volumes have an impact on NYCT service and service planning.	X Timing of changes to Penn Station or the implementation of the Gateway Project would have little impact on NYCT's operations or planning. However, expanded capacity or ridership at Penn Station would have an impact on NYCT planning.	Discretionary (0 L 0)
MTA	X The MTA as a whole derives little power. Much of the power is ceded to individual sub-agencies.	√ The MTA has legitimacy as a state agency and a voice.	X Individual sub-agencies determine the urgency of issues.	Discretionary (0 L 0)
Tri-Venture	X This is a loose organization of the three railroads that operate at Penn Station, but does not include New York City Transit. They derive power from cooperation, but there may be an imbalance of power within the network itself.	√ By including the key rail stakeholders, the Tri-Venture has legitimacy.	√ Urgency is derived from the position of the individual actors that make up the Tri-Venture.	Dependent (0 L U)
New York Metropolitan Transportation Commission (NYMTC)	X A board whose members represent the views of individual stakeholders primarily directs NYMTC. It has little power to impose its will and controls only a portion of federal transportation funding. It controls data and modeling in the region.	√ NYMTC has legitimacy by way of having a federally protected role in transportation.	X NYMTC has less of a stake in regional rail issues, and is charged with maintaining a long-term transportation plan. While Penn Station affects this, its completion is not an urgent issue for the organization.	Discretionary (0 L 0)

North Jersey Transportation Planning Authority (NJTPA)	X NJTPA board made up of members who represent the views of individual stakeholders. It has little power to impose its will and controls only a portion of federal transportation funding. It works with NYMTC on regional data and modeling, as well as coordinating long-term plans.	√ NJTPA has legitimacy by way of having a federally protected role in transportation.	√ NJTPA has an interest in the completion of the Gateway tunnels because it has a significant impact on the long-term travel options in New Jersey. However, rail again is not at the forefront of their concerns.	Dependent (0 L U)

Other Stakeholders				
Actor	**Power**	**Legitimacy**	**Urgency**	**Type (P L U)**
Vornado Realty Trust	√ Vornado owns 9 million sq. ft. of real estate around Penn Station, including One Penn Plaza adjacent to the station, and will have an impact on what the future of this space and neighborhood will look like. Vornado may also be a key player in funding changes at Penn Station.	X As a real estate developer, Vornado is often viewed as not having the public interest in mind.	X Positive changes to Penn Station could increase Vornado's profit, but this is likely not a top priority. Vornado was partnered with Related on the Moynihan; the results of the renewed RFP for a new project at Moynihan have not been released. Once an investment has been made, however, they will expect a return.	Dormant (P 0 0)
Related Companies	√ Related is developing the Hudson Yards project, very	X As a real estate developer, Vornado is often viewed as not	X Positive changes to Penn Station could increase	Dormant (P 0 0)

	close to Penn Station, and was one of the initial developers on the Moynihan Station project. Related will have an impact on what the future of this space will look like. Related may also be a key player in funding changes at Penn Station.	having the public interest in mind.	Related's profit, but this is likely not a top priority. Related was partnered with Vornado on the Moynihan; the results of the renewed RFP for a new project at Moynihan has not been released. Once an investment has been made, however, they will expect a return.	
Labor Unions	√ Have some coercive power since they can organize strikes and make wage and contractual demands of employers.	X Although they are legally recognized representatives of industry workers, they do not have a binding vote in the development of new infrastructure.	√ Development of HSR on the NEC and other changes at Penn Station would directly affect jobs in transport and in the railroads.	Dangerous (P 0 U)
Municipal Arts Society	X The Municipal Arts Society is an advocacy group that is well respected, but has little ability to impose its will in a relationship.	√ MAS has a long history of advocating for projects with positive impacts on the quality of life for New Yorkers. They generally have legitimacy through their moral position. MAS was founded in 1893 to fight for "intelligent urban planning, design, and preservation through education, dialogue, and advocacy" (MAS, 2016).	X MAS generally advocates for long-term projects. There is at times urgency, but much of their work is focused on long-term change.	Discretionary (0 L 0)
Regional Plan Association	X Very similar to MAS, RPA is a well-respected advocacy	√ RPA is also considered a legitimate group whose	X Some projects may have more urgency than others,	Discretionary (0 L 0)

	group that has a long history in the city, but little ability to impose its will. It works to influence decision-making in the region.	opinions are respected. RPA is focused on improving the quality of life and economic competitiveness of the New York metropolitan region. They have been in existence in 1929 and have a good reputation.	depending on the current situation.	
Other Advocacy Organizations	X Large donors can influence a political campaign, but most groups alone cannot outright influence policy.	X These 'fringe' groups are often considered too extreme to garner large public opinion support; even large, well-established groups are often stigmatized as not representing the interests of the general public.	√ These groups are often focused on only a few issues, so those that have a stake in public transportation in NYC will consider it vital.	Demanding (0 0 U)
Madison Square Garden	X The future of MSG's existence above Penn Station depends heavily on the New York City Planning Commission. Although they are a wealthy partner, it is up to the city whether they can remain.	X Many feel that MSG has limited the ability to rethink Penn Station and that they do not have the public interest in mind.	√ MSG was issued a 10-year extension of their permit in 2014. There is only a short time left before they may be forced to move.	Demanding (0 0 U)
Alliance for a New Penn Station	X The parties that make up the Alliance have little power.	√ The Alliance is made up of organizations that have legitimacy among other actors in New York.	√ The Alliance was created to put forth the urgency of the project.	Dependent (0 L U)

6.2.2 Interpersonal versus Institutional Relationships

Through interviews with stakeholders, it became clear that interpersonal relationships are very important in decision-making and progress in the New York region. In order to achieve goals, it is necessary that individual staff members across organizations know and trust one another; formal institutional relationships do not exist in many cases, but these informal networks formed through prior professional or education relationships enable projects to move forward. This thesis does not explore deeply the network of interpersonal relationships among individuals in transportation organizations; the London School of Economics is exploring the question of institutional capacity in New York City through their New Urban Governance project, results from which are expected in Fall 2016 (Ferreira da Cruz, 2016).

Formal institutional relationships often take place in "institutionalized venues for collaboration", discussed further in the next section.

6.2.3 Institutionalized Venues for Collaboration

Participation in the same policy events or institutionalized venues (such as MPOs or regional membership groups) can be beneficial for collaboration (Rantala, 2012). However, in the New York context many of these groups are not very powerful because actors come with their own agendas and little incentive for true compromise. Few have any true power to make decisions or to impose their will on their component organizations. Anecdotally, previous attempts to create true regional collaboration at an executive level among senior leadership has failed in the past, perhaps due to personality or interest conflicts.

These organizations exist to bring together stakeholders in a single space, but all operate with the interests of each stakeholder in mind, rather than a central regional authority that can incentivize actors to cooperate and compromise, thinking about what is best for the region and how each stakeholder can contribute.

The main institutionalized venues for collaboration identified in the region are:

- New York Metropolitan Transportation Commission (New York MPO)
- North Jersey Transportation Planning Association (North Jersey MPO)
- Metropolitan Transportation Authority[7]

[7] The MTA has been included as an institutionalized venue for collaboration because although it is a single agency with different sub-agencies, each sub-agency essentially operates as its own

- Northeast Corridor Commission
- Gateway Development Corporation
- Port Authority of New York and New Jersey[8]
- Alliance for a New Penn Station
- Tri-Venture[9]

Of these organizations, two are metropolitan planning organizations, meant to be formal avenues for regional collaboration; one is a regional transport operator (though only operating in the state of New York) and one is an alliance of non-profits. Four of these organizations were authorized or mandated by the federal government (the MPOs, the Port Authority and the Northeast Corridor Commission). Only the Tri-Venture focuses on Penn Station, and it is expected that the Gateway Development Corporation will have some focus there as well. These organizations were discussed in the stakeholder typology in Table 6-1, and in further detail in the discussion of actors in Chapter 3.

The Alliance for a New Penn Station is a clear outlier; it operates as a consortium of advocacy organizations that does not have formal links to the rail operators or local governments. Referring back to the beginning of the chapter, Figure 6-2, on page 161, shows the eight organizations in the previous list and their connections to one another based on the number of common connections.

6.2.4 Key Policy Events and Reports

In addition to their membership in regional organizations such as those discussed in the previous section, participation in key policy events and decision-making statutes can also increase the number of opportunities for collaboration among stakeholders, and indicate the strength of their relationship and willingness to work together.

There were many policy events that have affected Penn Station and the trans-Hudson River tunnels. The main topics of these events are Moynihan Station, the ARC Project, the decision regarding Madison Square Garden and the Gateway Project. A summary of these events is listed in Table 6-2; it may not be exhaustive.

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organization and follows its own interests. It runs service throughout the New York side of the metropolitan area.

[8] The Port Authority has also been included in this list because although it operates its own infrastructure, it was created in order to bridge differences between New York and New Jersey and is one of the few institutionalized opportunities for the two states to work together.

[9] The Tri-Venture is a network that includes the three railroads operating at Penn Station. It meets quarterly to discuss issues regarding Penn Station.

Table 6-2: The relevant policy events considered in the analysis

Event name	Proposal/ Decision date	Involved Actors	Main decision/policy proposal
Friends of Moynihan Station created	2005	MAS, RPA, New York Landmarks Conservancy, General Contractors Association, Manhattan Community Board 4	Leverage support for the creation of Moynihan Station
Amtrak announced intention to move majority of its operations into Moynihan Station	September 2009	Amtrak	Created momentum for project
Moynihan Station Phase 1 received $83.3 million in TIGER funds	February 2010	Federal government, Amtrak	
Ground broken on Phase 1 of Moynihan	October 18, 2010	Moynihan Station Development Corporation, Empire State Development Corporation	
Gov. Christie cancels ARC project	October 27, 2010	New Jersey	Funds moved to roadway projects (including billions from Port Authority)
PANYNJ takes control of Moynihan station project from ESDC and MSDC	October 2011	NY Governor, MSDC, ESDC, PANYNJ	Commitment to project from Governor
MSG filed an application to continue to operate an arena on the site in perpetuity	December 2012	Madison Square Garden	
Leading civic groups launch 'New Penn Station Alliance'	March 20, 2013	MAS, RPA	
Manhattan Borough President Scott Stringer recommends granting MSG a 10-year operating permit	March 27, 2013	City of New York	
City Planning Commission hearing on MSG's application for a special permit	April 10, 2013	New York City Planning Commission	

RPA panel on the future of Penn Station and MSG at Annual Assembly of New York	April 19, 2013	RPA	
City Planning Commission unanimous decision to grant MSG a 15-year permit	May 22, 2013	New York City Department of City Planning	Could be a loophole if MSG negotiates a deal with the railroads that operate in Penn Station
Federal government allocates $185 million for first phase of Gateway Project	May 30, 2013	Federal government	Build an 800-foot concrete casement for two new rail tunnels
City Council hearing on MSG	June 19, 2013	New York City Council	
City Council votes to grant MSG a limited 10-year permit to operate above Penn Station	July 24, 2013	New York City Council	Allows rethinking future of Penn Station
Gateway Development Corporation Created	November 2015	Governor Cuomo, Governor Christie, PANYNJ	
Governor Cuomo reissued RFP for Moynihan Station project and announces vision for "Empire State Station Complex"	January 2016	Governor Cuomo	The State of New York may have to pay the developers previously in charge of the project, Related Companies and Vornado Realty Trust, $30 million if the project is given to a different partnership.

In addition to these key events, there have also been many calls by civil society groups to refocus the perspective of work back onto the impact of any changes at Penn Station on the people and economy of New York. This is clear through the list of reports, publications and testimonies that the two main advocacy groups focused on this issue, Regional Plan Association and Municipal Arts Society, have undertaken, shown in Table 6-3. Neither group holds much power or implementation clout, but their interest in the topic indicates the broader regional importance of the issue.

Table 6-3: The relevant publications from advocacy groups regarding Penn Station

Publication	Date	Author	Summary
The ARC Effect: how better transit boosts home values and local economies	July 2010	RPA	
MAS unveiled the four new visions for a re-imagined Penn Station	May 29, 2013	MAS, Diller Scofidio + Renfro, H3 Hardy Collaboration Architecture, SHoP Architects and SOM	
Unlocking Penn's Potential: Establishing a Penn Station Redevelopment and Revenue Capture District	July 2013	MAS	
Op-ed by Robert Previdi, former NYCT exec giving ideas on improving Penn Station without moving MSG	Oct 2, 2013	Former NYCT executive	A call for interim station improvements without relying on moving MSG
Penn 2023: Envisioning a new Penn Station, the next Madison Square Garden, and the future of West Midtown	October 17, 2013	RPA, MAS	
Penn 2023: Madison Square Garden: Shaping the Future of West Midtown	October 2014	RPA, MAS	

6.3 Key Relationships and Links among Stakeholders

We have seen that many of the attempts to create venues for collaboration have been fraught with contention and have not led to change in how decisions are made across the metropolitan region. The professional relationships among institutions and individual staff across the metropolitan region are what enable work to be done. We will discuss the current nature of key relationships in this section and comment on their influence on decision-making. Looking at relationships between pairs of stakeholders, we will comment on areas including: how different important groups relate to one another, how history has influenced these relationships, how they share information with one another and what insiders from the organization think about the future.

We further consider participation in events and institutionalized venues for collaboration, core frames and discourse between organizations and knowledge pathways and relationship brokerage.

The strength of relationships can also be characterized by network variables based on publicly available information and interviews with key stakeholders from key organizations. By examining ties between organizations based on relationship characteristics listed below, we can better understand the relationship and its power dynamics. In our discussion of each relationship, we consider these characteristics as a part of our analysis:

- Formal and informal collaboration,
- Conflict,
- Knowledge sharing,
- Perceived agreement
- Perceived disagreement,
- Perceived influence, and
- Shared affiliations (Howlett, Mukherjee, & Koppenjan, 2015) .

A discussion follows of the relationships between two individual stakeholders and the impact of these relationships on decision-making about Penn Station and the Gateway Project.

6.3.1 New Jersey Transit and Amtrak

The relationship between Amtrak and New Jersey Transit is one of the most important, and most difficult, relationships in the region. While New York Penn Station is a key point of contact, their need for collaboration continues throughout the State of New Jersey where NJ Transit trains run on Amtrak track. Over 80 percent of NJ Transit riders touch the Northeast Corridor. According to the New Jersey State Rail Plan of 2015, the relationship between Amtrak and NJ Transit is governed by a series of contracts that address:

- Access terms and compensation,
- Payment for electric power consumption,
- Compensation to Amtrak for its capital costs for state-of-good repair improvements,
- Equipment maintenance services performed for NJ Transit by Amtrak at Sunnyside Yard, and
- Business terms associated with NJ Transit fully-funded infrastructure improvements on the NEC (NJTRANSIT & NJDOT, 2015).

In total, these contracts total about $100 million per year paid by NJ Transit to Amtrak as mandated by PRIIA 2008. Both organizations are also part of the NEC Commission, which requires the states on the NEC to periodically reevaluate operating, planning, investment, governance and cost-allocation relationships. According to officials at both NJ Transit and Amtrak, staff at both railroads work together constantly in order to run day-to-day service, but there is hesitation about formal interactions and cooperation from senior level management due to competing objectives and interests across borders. Both Amtrak and NJ Transit often get lambasted in the media, and are defensive about the challenges of running their respective systems, and about responding to criticism.

As the owner of the rail infrastructure, Amtrak is responsible for infrastructure maintenance and train dispatching for both railroads on its infrastructure, as well as at Penn Station. NJ Transit has the right to operate on the Northeast Corridor according to federal law. Within New Jersey, Amtrak serves six stations: Newark, Newark International Airport, Metropark, New Brunswick, Princeton Junction and Trenton, while NJ Transit runs service on 12 routes throughout the state. The two railroads are in direct competition for passengers along the Northeast Corridor, shown in Figure 6-4, owned by Amtrak and leased by NJ Transit. Riders can take a 90-minute NJ Transit train for $16 from Penn Station to Trenton, NJ or a 50-minute Amtrak ride for $40.

Amtrak dispatches NJ Transit trains in and out of Penn Station from the Penn Station Control Center, which Amtrak co-owns with Long Island Rail Road. NJ Transit also leases space at Sunnyside Yards in Queens from Amtrak to use for midday storage in order to ensure sufficient capacity available for the evening peak. NJ Transit train sets are also washed in the Amtrak car wash at Sunnyside Yards.

Figure 6-4: The Northeast Corridor in New Jersey, shown in red (Boyle, 2011).

At New York Penn Station, NJ Transit typically operates 166 inbound trains and 164 outbound trains on weekdays. Four NJ Transit lines come into New York Penn Station: the North Jersey Coast Line, Gladstone Line, Montclair-Boonton Line and the Morristown Line, while other NJ Transit passengers connect to Penn Station at Secaucus Junction. Amtrak typically runs 53 inbound and 53 outbound trains through Penn Station on a given weekday.

New Jersey cites operational fragmentation and trans-Hudson mobility as its top passenger rail challenges in its 2015 State Rail Plan. According to the plan, "although cooperative planning among the parties exists in some form today, the underlying focus of the parties is on individual goals. Current cooperation is significantly oriented towards individual projects, rather than broader institutional changes that could introduce greater efficiencies in New Jersey's rail operations" (NJTRANSIT & NJDOT, 2015).

In discussions with officials from both New Jersey Transit and Amtrak, both sides noted frustration with working across agencies. A quasi-private organization, Amtrak has more leeway in making independent decisions, while NJ Transit staff must be empowered by the governor. The two railroads must collaborate constantly, however. New Jersey Transit and Amtrak operations are intertwined along the length of the Northeast Corridor in New Jersey as well as at New York Penn Station. Even at a rail station owned by NJ Transit, Newark Penn Station, there must be an agreement with Amtrak regarding their use of station space and platforms for Amtrak passengers; every Amtrak train passing through New Jersey stops at Newark Penn Station. Similar agreements exist for NJ Transit passengers at New York Penn Station, owned by Amtrak.
While LIRR, the other commuter railroad at Penn Station was able to negotiate, in a time of financial weakness for Amtrak, a more favorable agreement for sharing of space and dispatching, NJ Transit was not in the same position, and thus holds a lesser position at Penn Station. In addition, they are affected dramatically by the condition of the North River tunnels under the Hudson River, which they share with Amtrak.

The institutional history between NJ Transit and Amtrak has been "a very contentious and difficult relationship, as evidenced by those letters and reactions you got in July [2015]", referring to letters that Governor Christie and then-NJ Transit direction Veronica Hakim sent to Amtrak following electrical problems on the trans-Hudson line that suspended service and caused lengthy delays (Rinde, 2015).

6.3.1.1 GATEWAY PROGRAM

On the Gateway Project, to build two new tracks leading to Penn Station under the Hudson River, NJ Transit is the lead agency on the EIS process for the Gateway program because Amtrak is legally not allowed to lead such a process. Amtrak is taking the lead on preliminary engineering. NJ Transit recently did an EIS for the ARC project, so they are familiar with the process. The FRA considers Amtrak to be a private company, so there is the idea that they are a self-interested party without a view of the public objective. This also complicates the relationship between the two railroads.

Gateway was originally supposed to be an Amtrak project because NJ Transit was going to independently increase their capacity into New York City through the ARC project, but once

ARC was cancelled, has eventually come on board the Gateway Project with Amtrak. However, according to NJ Transit officials, the actual capacity increase for NJ Transit is still unknown and will likely not be as high as it would have been with ARC. Amtrak has been ramping up planning for the Gateway Program for quite a while now, and is currently in the stage of hiring more staff. They are now bringing in additional partners including NJ Transit, the Port Authority and the federal government.

Amtrak feels that they cannot be responsible alone for raising the $20 billion necessary because it is not their project alone. An Amtrak official noted, "it benefits primarily NJ commuters [and] it's a federal project as well". While Amtrak took the lead on the initial development, they anticipated a partnership with other stakeholders including NJ Transit and the federal government, which is finally coming to fruition.

According to an official at Amtrak, it was difficult to engage in a partnership initially with NJ Transit because Governor Christie of New Jersey had not publicly endorsed the Gateway project, so the staff at NJ Transit did not have a green light to engage with Amtrak on the project. An Amtrak official characterized NJ Transit's position as "we know you have this big project called the Gateway program, but we can't really talk to you about that".

Hurricane Sandy helped to slowly catalyze work on the Gateway program. Amtrak published the results of the independent engineering analysis of the North River tubes in October 2014 that underscored the urgency of maintenance and replacement of the tunnels (Schulz, 2014). Only after Sandy was NJ Transit given the go-ahead from Trenton to engage in the project. However, they initially couldn't engage beyond the tunnel replacement portion of the project.

Politicians got another wakeup call after July/August 2015 when there were significant delays due to maintenance failures in the tunnels. New Jersey, New York, the federal government and Amtrak made the commitment to the full project on November 12, 2015. The public announcement of financial support and commitment from the USDOT and the states of NY and NJ has helped propel the project forward. However, NJ Transit has funding constraints, and still cannot make long-term funding commitments. According to Amtrak, this makes it difficult to move forward with design and implementation of the Gateway Projects.

6.3.1.2 RELATIONSHIP SUMMARY – AMTRAK AND NJ TRANSIT

Collaboration	There are many points of collaboration particularly below the senior levels and the staff work together very regularly. Many of these connections are informal and based on personal relationships.
Conflict	Conflictive relations over Gateway Project and Penn Station. Conflict at senior levels of management due to historic design of relationship and differing priorities. NJ Transit is focused on customer service in New Jersey, while Amtrak is focused on the broader NEC and overall profitability.
Knowledge	Both sides have important knowledge, particularly on the Gateway program. NJ Transit has done an EIS previously while Amtrak has substantive engineering knowledge.
Perceived agreement	Both sides see Gateway as a necessary project.
Perceived disagreement	Amtrak believes strongly that they should not be the only railroad on the project and that NJ Transit holds a very high level of responsibility for the project. There is conflict over the correct level of cost-sharing and responsibility for the project.
Perceived Influence	Amtrak is a powerful player due to their perceived independence from direct political control, though Congress controls their financial status and well-being.
Affiliation	Both are part of the same stakeholder networks including the Tri-Venture, NEC Commission and somewhat represented in the Gateway Development Corporation.

6.3.2 LIRR AND AMTRAK

The relationship between LIRR and Amtrak is less contentious than that between Amtrak and NJ Transit. While LIRR has played little role in the Gateway Project, it does have a significant interest at Penn Station. Amtrak provides service to 25 stations in New York State, but none on Long Island; the two railroads interact primarily at Penn Station and Sunnyside Rail yards.

LIRR is in a very different position than NJ Transit with regards to Penn Station because it came into the station at a time when Amtrak desperately needed funding assistance. LIRR

funded half of the Penn Station Control Center, and controls its own dispatching and scheduling, working with Amtrak to avoid conflicts. However, there continues to be questions from LIRR about where Amtrak will get funding to manage delayed maintenance issues.

One source of tension between LIRR and Amtrak is the East River Tunnels, which are owned by Amtrak. While not in as dire a situation as the Hudson River tunnels, the East River tunnels were also damaged during Superstorm Sandy and require repair. The priorities for LIRR and Amtrak with regards to the East River Tunnels do not necessarily align. For Amtrak, the Hudson River Tunnels are a higher priority, and they cannot manage both repairs at once due to the limited capacity in both tunnels and the impact on capacity at Penn Station and throughout the Northeast Corridor. According to officials, however, there have not been protocol discussions on these issues at a senior staff level. There is no clear understanding of who is empowered to make decisions on either side. Change management is an important point for the future of this relationship.

The two railroads started negotiating the share of Penn Station in the 1980s. LIRR had initially had an agreement with Pennsylvania Railroad in the 1960s, the predecessor to Amtrak, which allowed the right to use Penn Station and tracks and tunnels extending through the East River tunnels into Queens and through the North River tunnels into New Jersey and beyond (Amtrak & MTA LIRR, 1988). This agreement also specifies that "LIRR has permanent easements for the property occupied by its infrastructure including tracks, signal and third rail power distribution equipment and other equipment needed to operate and maintain its service" (USDOT, 2011). Amtrak maintains the catenary power distribution system.

In 1984 there was an agreement on the table that would have allowed LIRR to lease the entire Pennsylvania Station from Amtrak for 99 years for $45 million, but this was later withdrawn by Amtrak, who was worried about the uncertainty of its finances at the time and decided they did not want to give up control of the station. The two parties then came up with a proposal for a tax-free, nonprofit corporation to be set up by the New York State Legislature that would run the station and be staffed by representatives of both railroads. This bill was passed by the New York State Legislature on June 29, 1985, but Amtrak issued a statement four days later stating that the corporation "is not necessary, desirable or suitable" and Amtrak would not be involved in it (Higham, 1985).

The two railroads then came to an agreement in 1988 for a joint facility agreement governing Penn Station, and a joint venture agreement for a new control center for Penn Station. The joint facility agreement stated that the two railroads were entering into a joint venture agreement "for the purpose of jointly designing, constructing, and operating a

modern system for the centralized control of train movements within Penn Station and certain railroad approaches thereto", and entered Amtrak and LIRR into a lease that guarantees LIRR the right to use certain portions of Amtrak's property between "the westerly terminus of the LIRR system in the vicinity of Harold Avenue in the County of Queens and the public ways and facilities adjoining Penn Station in the County of New York" (Amtrak & LIRR, 1988). This portion of the agreement laid out the right of LIRR to use a portion of Zone 1, defined as "all of those facilities and appurtenances of Penn Station (a) which are located upon or consist of its first floor level above the tracks (hereinafter designated as the arrival concourse)…, and (b) which are embraced generally in the block between 7th and 8th Avenues, and 31st and 33rd Streets, all in the said County of New York" (Amtrak & LIRR, 1988).

In some areas, LIRR is fully responsible for maintenance, in others Amtrak is the responsible party and in some areas, the responsibilities are shared between LIRR and Amtrak through formulas that are usually based on the number of trains operating through the area (USDOT, 2011).

These agreements also affect two key pieces of infrastructure, the Sunnyside Yards and the Penn Station Control Center.

6.3.2.1 SUNNYSIDE RAILYARDS

One interviewee characterized "border wars" between LIRR and Amtrak, particularly at Sunnyside Yard where improvements and reorganization are taking place. This is partially due to union issues, but also because of land ownership and maintenance charge questions for the work being done at the railyards. There is no clear designation of who is empowered from each railroad to make decisions or agreements at either the station or the railyards.

The railyards are important to Penn Station because they are the access point from the east and Amtrak, LIRR and NJ Transit all use the yards to store trains and prepare for service. Amtrak and LIRR jointly own the facility. Amtrak received HSR funding from the federal government for an underpass at the yards to facilitate future HSR trains into Penn Station. New Jersey Transit also uses the railyards for mid-day storage to facilitate serving the afternoon peak in agreement with Amtrak.

6.3.2.2 PENN STATION CONTROL CENTER

The position of superintendent of the central control center alternates between Amtrak and LIRR every six months. This position has the operating authority to direct train movements within the Joint Control Territory. Amtrak and LIRR have an equal number of train movement supervisors that report to the terminal superintendent.

Under the terms of an agreement dated August 5, 1988, LIRR and Amtrak entered into a joint facility agreement to manage design, build and manage the Penn Station Control Center. This agreement was to amend and update the agreement that LIRR entered into with the Pennsylvania Railroad Company, Amtrak's predecessor, on January 20, 1966, which granted LIRR the right o use Penn Station and tracks and tunnels extending through the East River tunnels into Queens and through the North River tunnels into New Jersey and beyond (Amtrak & MTA LIRR, 1988). The joint venture stated that the two parties, Amtrak and LIRR, have equal rights in the management and conduct of control center.

6.3.2.3 RELATIONSHIP SUMMARY – LIRR AND AMTRAK

Collaboration	There are many points of collaboration particularly below the senior levels and the staff work together very regularly. Many of these connections are informal. The railroads do collaborate formally at the Penn Station Control Center, with a revolving superintendent every six months.
Conflict	Contentious relations over Sunnyside Yards, the East River tunnels and space at Penn Station. Conflict at senior levels of management due to historic design of relationship and differing priorities (Long Island and access to the city vs. access to the NEC).
Knowledge	Both are perceived to be capable of decision-making
Perceived agreement	Relatively neutral current relationship
Perceived disagreement	Urgency of repairs to East River Tunnels
Perceived Influence	Amtrak owns the tunnels and has chosen to work on the Hudson River Tunnels first
Affiliation	Both are part of the same stakeholder networks including: NEC Commission, Tri-Venture

6.3.3 CONGRESS AND AMTRAK

Amtrak relies heavily on the federal government for funding authorization, and for regulation. In many senses, the primary customer of Amtrak is Congress because of the

reliance on Congress for subsidies; Amtrak must align with their interests. Congress has historically passed a passenger rail authorization every four to six years which sets policy for how intercity passenger service is funded, managed, planned and overseen at both the federal and state level. The amount that is authorized for the operations and capital needs of passenger rail (Amtrak) is a guideline for the House and Senate Appropriations Committees. These committees then determine the actual annual spending for Amtrak. The Passenger Rail Investment & Improvement Act of 2008 (PRIIA 2008) expired September 30, 2014. Congress did not pass another passenger rail authorization bill until December 2015 when it was incorporated for the first time in the surface transportation bill; financial appropriations between the expiration of the bill and the new surface transportation act were provided without authorization until the new bill was passed, but policy provisions included in PRIIA 2008 continued to be in effect until amended or replaced with a new bill.

Leading up the incorporation of Amtrak provisions in the surface transportation bill, the House and Senate both discussed and passed different versions of the passenger rail reauthorization bills. The House passed a version of passenger rail reauthorization, the Passenger Rail Reform and Investment Act of 2015 (PRRIA 2015) on March 4, 2015. The highlights of PRRIA 2015 were an increase in the role of states in managing intercity rail routes, and maintenance of current funding levels for Amtrak while attempting to introduce reforms to have Amtrak increase transparency, reduce losses and operate more like a private-sector business (Shuster, 2015). The Senate responded with the Railroad Reform, Enhancement, and Efficiency Act (RREEA 2015) which a focus on increasing safety, leveraging private sector investment and facilitating increased competition, cutting red tape, investing in infrastructure improvements and empowering states to have an increased role on state-supported routes (Wicker, 2015).

In the end, funding for Amtrak was incorporated for the first time in the surface transportation bill, the FAST Act, passed on December 4, 2015. There were few changes to the funding or authorization of Amtrak, but passenger rail has now been put on equal footing with traditional highway and transit programs. The FAST Act is the first federal law in over a decade to provide transportation funding for more than two years. It formally reauthorizes the 18.4 cents per gallon gas tax typically used to fund transportation projects, but does not increase it. The FAST Act authorizes $305 billion in funding from 2016 to 2020 for surface transportation infrastructure planning and investment (USDOT, 2016).

Amtrak's funding model and the uncertainty that surrounds it makes it difficult to plan for long-term infrastructure. Amtrak is currently taking advantage of federal funding for high-speed rail and the East Side Access program to get as many improvements paid for as

possible, including the Harold Bypass of Sunnyside Yard. Other federally funded projects for Amtrak include East Side Access, HSR and the Farley Post Office/Moynihan Station project.

6.3.3.1 RELATIONSHIP SUMMARY – CONGRESS AND AMTRAK

Collaboration	Congress has significant power over Amtrak; it is not a highly collaborative and somewhat adversarial relationship.
Conflict	Interests from outside of key corridors can have significant impact on the ability of Amtrak to run service in their profitable corridors.
Knowledge	There are few rail experts in Congress.
Perceived agreement	Both generally have a national interest in rail service.
Perceived disagreement	Timelines for funding and the level of funding needed. Need to consider NEC as separate from the rest of the system. Some members of Congress may be against national passenger rail service.
Perceived Influence	Congress influences Amtrak through funding
Affiliation	Amtrak is a creature of the federal government

6.3.4 MTA AND THE STATE OF NEW YORK

The Metropolitan Transportation Authority is a public benefit corporation managed by the state of New York; the Governor appoints the head of the MTA. MTA service, however, runs primarily in New York City and its seven surrounding counties within the state. There are 19.3 million people in the State of New York, with 8 million within the New York City limits, and even more in the surrounding counties. While initially created to act as a relatively independent public authority, the MTA is in fact a highly politicized agency. It was not created to function as a state agency or department, and therefore did not receive regular direct general fund appropriations as other state agencies do(Eno & Transit Center, 2014). However, the Governor exercises control over the MTA through six board member appointments, and general influence over its positions and operations.

There has been significant disagreement among the MTA, the governor and politicians representing northern regions of the State of New York about the funding of the MTA 2015-2019 Capital Plan. The MTA board approved the new capital program in October 2015, totaling $29 billion over five years. The program is expected to be fully funded with $11.8 billion in MTA funds, much of which is borrowed against future fare revenue, $8.3 billion from the Governor, $6.4 billion in federal funds and $2.5 billion from New York City.

One major challenge is that the MTA has "no mechanism to hold the state government accountable for its finances. If the MTA needs more money, the state's response may be to blame MTA management despite the fact that the state effectively controls MTA management" (Eno & Transit Center, 2014).

6.3.4.1 RELATIONSHIP SUMMARY – MTA AND THE STATE OF NEW YORK

Collaboration	It is a relatively top down relationship with the Governor and State legislature making decisions affecting the MTA
Conflict	The Governor and legislature have broader priorities and do not always prioritize the MTA in funding. The MTA has no mechanism to hold the state accountable due to their relatively independent structure.
Knowledge	The State makes decisions affecting the MTA, but does not have the subject matter expertise
Perceived agreement	Both have an interest in the economic impact of the transportation system in New York City.
Perceived disagreement	State recently implemented oversight for MTA design projects that is felt to be unwarranted. The urban focus of the MTA does not always align with the State's broader interests outside of New York City.
Perceived Influence	The Governor's influence is felt acutely
Affiliation	The MTA is a creature of the state.

6.3.5 THE CITY AND STATE OF NEW YORK

The City and the State of New York have a tenuous relationship because while the City is the economic engine of the state, the capital, Albany, is located upstate and many

politicians are upstate. At Penn Station in particular, there is very little City involvement because other levels of government own much of the physical space and it is no clear where there is opportunity for the City to be involved, physically or administratively. The New York City Department of Transportation owns the streets, but because the station is below ground, there is little street space or administrative interface at Penn Station.

The relationship between the City and State of New York is partially dependent on the personal relationship between the Governor and the Mayor, but even in the case of Governor Cuomo and Mayor de Blasio, who have previously worked together at the U.S. Department of Housing and Urban Development under Bill Clinton, Cuomo as Secretary and de Blasio as Regional Director under him, this may not be enough (City of New York, 2016; Mckinley, 2016).

A New York Times article stated that in "interviews with lawmakers, lobbyists and government officials suggest that this governor [Cuomo] and this mayor [de Blasio] are simply very different political types, whose styles – conflict-based, and conflict-averse – do not mesh". A former assemblyman, Richard Brodsky said, "when you put them in the same room, it's like one is speaking Mandarin, and one is speaking Cantonese. You have two guys who have fundamentally different understandings of how power is wielded" (Grynbaum & Kaplan, 2015).

Governor Cuomo and Mayor de Blasio had a "contentious standoff" for months "over whether the city should pay significantly more toward the five-year [MTA] $29 billion capital plan – the authority's largest ever – which will cover the cost of maintenance and improvements to the sprawling network of subways, buses and commuter rail lines" (Fitzsimmons & Burns, 2015). In October 2015, Governor Cuomo pledged $8.3 billion in state funds, while Mayor de Blasio pledged $2.5 billion. Initially, the City had agreed to provide $657 million, but this increased to $2.5 billion after negotiations and agreements between the City and the State. These agreements included a clause that the state would not use the money from the City intended for the capital plan for any other purpose, and that the city would have some say over projects in the five boroughs.

Another issue that has highlights the relationship between the city and the state is congestion pricing. Congestion pricing was first proposed as a concept in the 1970s, when the NYCDOT tried to impose a "red zone", banning cars from entering midtown Manhattan during business hours and charging tolls on the East and Harlem River bridges (McArdle, 2016). It was brought back up in 2012 as a means to provide financing for transit projects within the City, possibly including some projects at Penn Station. Congestion pricing was not passed by the State legislature, but the measure was introduced to the State legislature again in March 2016. This is a particularly relevant issue to Penn Station because should rail capacity into the City from New Jersey be reduced, there is a high likelihood that

congestion will increase in New York City as commuters make the decision to use alternative modes, including personal vehicles.

6.3.5.1 RELATIONSHIP SUMMARY – THE CITY AND STATE OF NEW YORK

Collaboration	Governor Cuomo and Mayor De Blasio previously worked together, but have been at odds as governor and mayor
Conflict	Funding for the MTA Capital Plan
Knowledge	In some projects, it has been clear that each actor has their own version of knowledge.
Perceived agreement	Both the City and the State have expressed the need for change at Penn Station, and the importance of transportation.
Perceived disagreement	Levels of funding have been debated. The value of NYC for the state is another contentious issue.
Perceived Influence	Both are equally powerful.
Affiliation	Both appoint members to the MTA board. The City has some responsibility to the state and vice versa.

6.3.6 MTA AND THE CITY OF NEW YORK

The City of New York technically has no say over the MTA or the system that they run. Recently the City has made an agreement to provide more funding for the MTA and has begun to seek opportunities to increase cooperation and input into decision-making. While this affects the City's position with LIRR and NYCT, it does not necessarily affect their relationship with Amtrak or New Jersey Transit. The summer of 2015 saw divisive disagreement over financing of the 2015-19 Capital Program. The chairman of the MTA, Thomas Prendergast, had threatened to cut financing for NYC based projects with the city did not take on a larger share of the costs; the NYC Department of Transportation Commissioner, Polly Trottenberg, also a board member of the MTA, publicly called this "punitive and pretty divisive" (Fitzsimmons, 2015).

The City's pledged contributions to the MTA represent a "historic investment – the city's largest ever general capital contribution – while ensuring that New York City dollars stay in New York transit" (Fitzsimmons & Burns, 2015). For the City's $2.5 billion pledged share

of the cost of the capital plan, $1.9 billion will come from the city budget and $600 million will come from alternative revenue sources. The State has still not been clear about where its $8.3 billion pledge will come from. $1 billion were allocated in the FY 2016 State budget and an additional $7.3 billion will be provided in the FY 2017 Executive Budget. Of the FY 2016 $1 billion allocation, $750 million are to support the MTA's 2015-19 core capital program and $250 million are to advance the MTA's Penn Station Access project (Cuomo & Labate, 2016). "The state hasn't identified specific ways to pay for the remainder of the obligations" (Lentz, 2016). The proposed legislation specifies that the state will provide funds only when the MTA's capital resources have been spent. The MTA will receive $6.3 billion from federal sources. Based on the recent reauthorized federal transportation bill, this is consistent with current federal funding levels (Xu & Obichere, 2016).

Part of the debate has been the amount that city businesses and residents already pay into the MTA through fares and taxes; city businesses and residents pay $4.5 billion to the MTA in city and state taxes, while $2.1 billion comes from taxpayers outside of the city (Goldman & Klopott, 2015).

The MTA is isolated from municipal zoning and land use policies, and is prohibited from using value capture mechanisms. It does not control much real estate outside of the infrastructure needed to run the system and property used for transportation-related functions. Much of the MTA property is zoned as industrial, which puts constraints on potential development; "few MTA properties are suitably zoned for optimal as-of-right redevelopment" (Rosen, 2012). Most surplus property has already been disposed of by the MTA or its predecessor agencies. The MTA also cannot take on the risk of development as a public entity. There are other transit systems around the world that have taken advantage of air rights over transit authority property to help fund the system, but the MTA is currently not set-up to take advantage of this type of development.

In a recent move, the MTA's board approved a real estate deal to build a new skyscraper on the site of the MTA's former headquarters on Madison Avenue in Midtown Manhattan. City officials objected to the deal with a real estate developer because it would deprive the city of potential property-tax revenue. The MTA said that the authority would receive more than $1 billion in payments in lieu of taxes (PILOTs) as part of a 99-year lease. Polly Trottenberg, the City's transportation commissioner, noted that part of the discussion is whether these payments would be counted towards the city or state's expected contribution to the MTA capital plan. "The city wants to make something of a principle here that the MTA cannot unilaterally, essentially, grant a private developer [such a deal] without any input or agreement from the city" (Tangel, 2016b).

The 7-line extension to Hudson Yards was a City-led and –funded project. Former Mayor Michael Bloomberg advocated for the project in light of the new development at Hudson Yards, west of Penn Station. However, the station is now having leakage and maintenance problems, leading some to question the City's ability to be involved in transit projects.

The City is also heavily involved in the proposed Brooklyn-Queens light rail project. Advocates say that it will open up development on the waterfront, but dissenters say that it is not a socially-beneficial project because it does not connect to existing subway lines, and does little to serve transit-dependent, low-income communities in the two boroughs. It is still not clear who will own, operate and maintain the light rail system, if built.

In January 2015, there was a conflict between the governor, the City and the MTA. Governor Cuomo called for the entire transit system to be shut down in preparation for an anticipated winter storm; the first time in the 110-year history of the subway that the entire system was shut down (Barro, 2015). The City was not hard hit by the storm, but the closed system had major implications for workers across the City and for the economy. These implications include lost wages for those who cannot make it to work and do not get a paid snow day and lost productivity to employers. Governor Cuomo called the decision to shut the system down "a decision to err on the side of caution", but it was inconsistent with past MTA practice and the MTA Chairman Tom Prendergast's own remarks the day prior to the storm that "there was 'no reason' to close the underground portions of the subway system, because they are shielded from snow" (Barro, 2015). Overly cautious reactions to potential crises have been shown to poll well for politicians, such as an overreaction Cuomo had to the Ebola crisis in 2014, but overreactions have major implications when used as policy, such as the economic impact on individuals and the City overall.

6.3.6.1 RELATIONSHIP SUMMARY – MTA AND THE CITY OF NEW YORK

Collaboration	There has historically been little collaboration. This is starting to change with increased City financing to the MTA
Conflict	Funding conflicts. Conflict over the impact of service disruptions on the city.
Knowledge	The MTA is specialized in transit and has knowledge of how to deal with an aging system.
Perceived agreement	Need for state and federal funding

Perceived disagreement	Level of City funding
Perceived Influence	The Mayor has little influence over the MTA. The NYCDOT commissioner now sits on the MTA board.
Affiliation	The City is represented on the MTA board. The Mayor picks four representatives.

6.3.7 NEW JERSEY TRANSIT AND THE STATE OF NEW JERSEY

New Jersey Transit is a state agency that is heavily influenced by the politics of the governor. It was created as a state agency in the 1970s. While NJ Transit must wait for the governor's approval before engaging in projects such as Gateway, they also have the leeway to negotiate on their own on smaller, existing projects.

The governor authorizes funding for New Jersey Transit. Governor Chris Christie recently stated that NJ Transit cannot raise fares for FY2016, despite a $57 million budget deficit (Chernetz, 2016). New Jersey's Transportation Trust Fund (TTF) is also controlled by the governor, and is currently in a funding crisis; FY2016 is the last year the TTF is funded. The PANYNJ funds leftover from the cancelled ARC project were put into the TTF; these transfers stop in 2016. The PANYNJ leftover funds totaled $295 million annually since 2012. The lack of funding for the TTF may have dramatic ramifications for the ability of NJ Transit to run service; the Governor has historically been a proponent of road funding over transit funding.

Governor Christie, a Republican, has called on the Democrat-controlled legislature to put forth a proposal to fund the TTF. Authorization for the $1.6 billion fund expires on June 30, 2016 (Arco, 2016). Transportation commissioner Richard Hammer has said that by August, all repair projects will cease (Star-Ledger Editorial Board, 2016). New Jersey has the second lowest gas tax in the country.

6.3.7.1 RELATIONSHIP SUMMARY – NJ TRANSIT AND THE STATE OF NEW JERSEY

Collaboration	There appears to be little interaction between the governor and NJ Transit. NJ Transit must wait for authorization from the Governor for major decisions.
Conflict	The Governor must authorize collaboration on the Gateway Project and did so very slowly. The Governor

	has not set forth a plan to fund the state's transportation trust fund.
Knowledge	NJ Transit is specialized in transit
Perceived agreement	Both work for the people of New Jersey.
Perceived disagreement	Importance of funding the TTF
Perceived Influence	The Governor dictates the bounds in which NJ Transit can act.
Affiliation	NJ Transit is a state agency

6.3.8 LIRR AND MNR

While LIRR and MNR are both part of the MTA, they operate as separate entities with different personnel hiring processes, funding streams and unions, among other operating procedures. With plans to bring MNR into Penn Station following the completion of ESA, the relationship between the two railroads is important. This relationship between two systems that are part of the same agency shows the divide between actors in the regional transportation landscape.

At Penn Station, it is not clear what level of cooperation can be expected between LIRR and MNR. The New York governor called for MNR to be brought into Penn Station, likely made possible by potential decreases in LIRR service to Penn Station due to the completion of the ESA project at Grand Central Terminal (GCT). LIRR has stated, however, that despite increased capacity into Manhattan because of ESA, they are not planning on reducing service into Penn Station. Penn Station Access was a project driven by the governor, and ultimately the MTA will decide slot allocation at Penn Station for LIRR's existing slots. The experience at Grand Central Terminal with East Side Access may inform the characteristics of the relationship between the two railroads at Penn Station. GCT is owned by an investment company that bought the station in 2006 from the company that had acquired the real estate once owned by the bankrupt Penn Central railroad. While the MTA leases GCT from this investment company, it has a lease on GCT that expires on February 28, 2274. The MTA has an option to buy GCT and its tracks, also currently owned by the same investment company, in 2017, though this can be extended to 2032 by the current landlord (Roberts, 2013). The difference between Penn Station and GCT, however, is that at GCT, the landlord is not involved in station operations, while at Penn Station the landlord,

Amtrak, is present in the station and has significant control over operations and decision-making.

6.3.8.1 PENN STATION ACCESS

Penn Station Access is a project that is strongly supported by the governor of New York in order to bring increased rail access to the Bronx, and bring commuters into the West Side of Manhattan. The two railroads, MNR and LIRR, have had a contentious relationship at Grand Central Terminal, and it is unclear who will broker this relationship and negotiation of space at Penn Station. Penn Station Access has been driven by the Governor of New York; LIRR has a lease agreement with Amtrak, but this agreement will likely have to change should MNR enter the mix.

6.3.8.2 EAST SIDE ACCESS

The experience on the East Side Access project can inform what relationship and level of cooperation can be expected between the two railroads at Penn Station. According to a senior official working at MTA Capital Construction (MTACC) on the East Side Access project, there are vastly different priorities between the two railroads. They have very different operating philosophies despite both being part of the MTA. MNR prefers to do the majority of their work (construction, maintenance and operations) in-house, while LIRR generally hires external contractors, particularly for construction and maintenance.

According to another MTA official, at the start of the ESA program, the two railroads would not meet. It was only because of personal connections and an individual acting as a convener that meetings could occur between the two railroads. The contact stated that they did not believe that the meetings would have been able to happen had they not had personal connections at both railroads. The convener met with both railroads separately every two weeks at the beginning of the project, and later met with them together in order to broker an agreement regarding the joint and individual responsibilities at the station.

Grand Central Terminal has been MNR's responsibility since the railroad's creation in 1983, but many of MNR's routes ran into GCT under its predecessors, including New York Central Railroad, Penn Central and Conrail. MNR has restored GCT since its creation and prides itself on the restoration. The 1999 decision to pursue ESA has been characterized as bringing LIRR into MNR's home, which has much significance. LIRR indicated that they would plan to hire an operator for functions within the Grand Central Terminal, which was not an amenable decision for MNR. MNR was told by MTA higher-ups to give LIRR space at the terminal. This may be different at Penn Station since LIRR is not the owner.

While ESA is a functional merger of GCT, operations will be completely separate. Once ESA is completed, GCT will function essentially as two stations, one on top of the other. They

will have separate exits and platforms for LIRR and MNR service. While strong real estate interests around the station had an influence on this decision due to the potential difficulty of building closer to street level and underpinning buildings, a senior official said that much of the decision had to do with the railroads' difficulty in working together and integrating operations. While rail operations will be handled separately, there are some functions that will need to be handled jointly, including security and emergencies. Currently MNR responds to emergencies in the station, ranging from arrests to trash fires or passenger health emergencies. LIRR will need to join the GCT fire brigade. The MTA police department has jurisdiction for both LIRR and MNR and will operate out of the station for both railroads.

The two railroads are working on a rail activation plan for the terminal in order to be prepared for the opening day. East Side Access is scheduled to be completed in December 2022 (Worrell, 2016). Participating jointly on the plan was not always a given; there was a lot of effort between individuals in order to get the railroads to agree to joint operating protocols. Meetings between the two railroads on ESA issues were tense, despite good relationships between the individuals in the meeting. It was clear that staff were not empowered to make significant compromises. Language used during on rail activation planning meeting included "express[ing] grave concern" on the part of MNR in regards to decisions made by LIRR "in passing, [but] not formalizing". The rail activation plan is for LIRR to be ready to begin service, but MNR felt that it was important that they be brought in. Rewrites and changes to the rail activation plan (RAP) were required because MNR was not involved in the beginning of the process. There was contention about the definition of "we" when discussing the RAP, and whether MNR should be included in that definition. In the end, joint involvement was agreed upon, with LIRR taking control as the client, but MNR maintaining an advisory and voting role. There are separate asset management plans between the two railroads.

6.3.8.3 RELATIONSHIP SUMMARY – LIRR AND MNR

Collaboration	Collaborate reluctantly on East Side Access.
Conflict	Despite both being part of the MTA, the relationship is relatively tense. East Side Access has been a source of tension due to LIRR coming into MNR's territory.
Knowledge	Both run commuter railroads but have different operating policies
Perceived agreement	Both railroads see value in having station terminals on the

	west and east sides of Manhattan.
Perceived disagreement	Whose operating procedures to use
Perceived Influence	Both on relatively equal footing
Affiliation	Both part of the MTA. Both may soon be at Penn Station as well as GCT.

6.3.9 NEW JERSEY TRANSIT AND MNR

New Jersey Transit is contracted to run short sections of MetroNorth's service in New Jersey, including continuing the service of MNR's Port Jervis Line that turns into NJ Transit's Main Line in New Jersey.

The two railroads cooperate to run "the Football Train" which carries fans to Meadowlands Stadium in Secaucus, New Jersey. This cooperation, where NJ Transit runs service starting in Connecticut on the New Haven Line, into Penn Station via Amtrak infrastructure, and finally onto Secaucus, started as a pilot project to test if there was an interest in Metro-North service to Penn Station, and whether it was possible to through-run trains at Penn Station involving two separate railroads. While it was initially a test run, the "Train to the Game" service continues for Giants and Jets home games at Meadowlands Sports Complex (MTA, n.d.-b).

6.3.9.1 RELATIONSHIP SUMMARY – NEW JERSEY TRANSIT AND MNR

Collaboration	Collaborate on the "Train to the Game", running trains on the New Haven Line through Penn Station to Meadowlands in New Jersey. New Jersey Transit runs short pieces of MNR service in New Jersey where MNR's Port Jervis line continues in New Jersey as NJT's Main Line.
Conflict	Labor unions presented an enormous challenge to the test operations of "Train to the Game".
Knowledge	Both are now knowledgeable on the challenges and opportunities of actually through-running at Penn Station
Perceived agreement	The "Train to the Game" provided benefit to both

	railroads.
Perceived disagreement	MNR is worried about possible NJ Transit labor strikes.
Perceived Influence	NJ Transit runs its service more hands on than MNR.
Affiliation	They currently are not part of the same organizations.

6.3.10 RAILROADS AND LABOR UNIONS

There are historical, territorial rights to railyards and infrastructure, and many of the individual unions have a history before the railroads were combined. Union issues mean challenges with technology, operations, personnel and labor relations. Labor relations rules specify what work can and cannot be done by non-unionized people. The presence of unions leads to indirect cost increases; in New York City the unions have the right to construction work and there is a required labor clearance before a third party can do work.

New Jersey Transit in particular has had a recent contentious history with unions. A potential strike by eleven labor unions was averted in March 2016. The new union agreement gave workers a 21 percent wage increase over eight and a half years. The unions were seeking a contract from July 2011 until the end of 2017. However, the agreement is tenuous and was rejected on May 3, 2016 by two unions representing NJ Transit's conductors and locomotive engineers; 14 other unions ratified their contracts ("Rail News," 2016).

NJ Transit union contracts expired five years ago. The New York region faced a similar strike in summer 2014 when LIRR workers threatened to strike; Governor Cuomo intervened and gave LIRR workers a seventeen percent wage increase over six and a half years. Governor Christie has a contentious relationship with public-sector unions (Tangel, 2016a).

6.3.10.1 RELATIONSHIP SUMMARY – RAILROADS AND LABOR UNIONS

Collaboration	Both are interested in keeping the railroads running
Conflict	There have been tense relationships between unions and the railroads in New York. Historically conflicts are over wages, work hours, benefits, and jobs.
Knowledge	Railroads require the knowledge of their unionized employees to keep the system running.

Perceived agreement	Both have an interest in keeping the railroads running.
Perceived disagreement	Unions must approve changes in operating procedures, such as collaboration between railroads due to labor laws and potential job elimination.
Perceived Influence	Unions hold influence over the operation of the railroads
Affiliation	Each railroad has different unions they negotiate with

6.3.11 NJ TRANSIT AND LIRR

The MTA and NJ Transit do some collaborative planning at the operational level at Penn Station in conjunction with Amtrak, but have no decision making power. There is little operational overlap between LIRR and NJ Transit because of the current physical operational structure of Penn Station. Both NJ Transit and LIRR have entered into leasing agreements with Penn Station Leasing, LLC, a wholly owned subsidiary of Amtrak for the right to use Penn Station's tracks and Facilities.

6.3.11.1 RELATIONSHIP SUMMARY – NJ TRANSIT AND LIRR

Collaboration	NJ Transit and LIRR interact only at Penn Station
Conflict	Some conflict over space at Penn Station but overall have few interactions leading to conflict.
Knowledge	LIRR has more operational knowledge at Penn Station due to their oversight of their own operations and dispatching.
Perceived agreement	Both railroads desire more autonomy at Penn Station.
Perceived disagreement	LIRR's desire for autonomy is less urgent.
Perceived Influence	LIRR is in a stronger position at Penn Station than NJ Transit due to joint venture agreements
Affiliation	Both are part of the Tri-Venture

6.3.12 THE STATE OF NEW YORK AND THE STATE OF NEW JERSEY

The current governors of the State of New York and the State of New Jersey, Governor Cuomo and Governor Christie, are among the major decision makers in the region. In both states, the governor has a large role in urban and commuter transport in New York because of their role in changing and allowing changes in institutional agreements.

The governors of the two states have had a tumultuous relationship. They worked together closely during the recovery from Hurricane Sandy, pushing for federal aid. There are disagreements in the media regarding the positive or negative nature of their relationship.

The two states also interact closely through the Port Authority of New York and New Jersey. The governor of each state appoints six members of the agency's Board of Commissioners, which must be approved by the respective state senate. The New York governor picks the agency's executive direction and the New Jersey governor selects the deputy direction, as well as the board chairman (Tangel, Haddon, & Dawsey, 2014). The governors retain the right to veto the actions of the Commissioners from their own state.

There was a scandal at the Port Authority in September 2013 regarding the closure of lanes on the George Washington Bridge. The Democratic mayor of Fort Lee, NJ suggested "that it was political retribution after he declined to endorse Mr. Christie, a Republican, for re-election" (Zernike, 2014). A series of federal investigations followed the closures investigated their legality and Governor Christie's possible role in the closures. Following this event, there was a bill introduced and passed unanimously in each state's senate with the goal to "curb patronage and political interference" at the Port Authority. Both governors vetoed the legislation (Zernike, 2015).

In August 2015, Governor Cuomo of New York said during a press conference "It's not my tunnel! Why don't you pay for it? It's not my tunnel. It is an Amtrak tunnel that is used by Amtrak and New Jersey Transit" (Rubinstein, 2015). Senators Cory Booker, representing New Jersey, and Charles Schumer, representing New York, intervened and Christie and Cuomo sat down with U.S. Transportation Secretary Anthony Foxx. The ultimate decision was that New York, New Jersey and the federal government would fund Gateway. In September 2015, Governors Cuomo and Christie sent a joint letter to President Barack Obama agreeing to fund fifty percent of the cost of the Gateway project if the federal government provided the other half; in November 2015, federal officials committed to funding at least half of the cost (Higgs, 2015).

6.3.12.1 RELATIONSHIP SUMMARY – THE STATES OF NEW YORK AND NEW JERSEY

Collaboration	Collaborated heavily after Superstorm Sandy on recovery. Historically have a contentious relationship. Both part of the New York metro area economic area.
Conflict	New Jersey is often in the shadow of New York, but both are influenced by New York City. New Jersey has hundreds of thousands of workers who commute to the city each day. Disagreement over funding for Gateway Tunnels.
Knowledge	Both share similar knowledge bases.
Perceived agreement	Were able to come to agreement over a recovery program.
Perceived disagreement	Disagreement over funding for Gateway Tunnels. Federal government had to step in.
Perceived Influence	Both governors have a fair amount of power, but over different issues. The governor of New York has more direct influence over Penn Station and economic development in New York, but the governor of New Jersey.
Affiliation	Governors choose representatives to the Port Authority of New York and New Jersey.

6.3.13 NJTPA AND NYMTC (MPOS)

The MPOs are not driving changes in institutional structure; they think more about federal capital outlays. NYMTC and NJTPA consult one another on the work they do, but they have little real power over what transportation in the region will look like.

NYMTC and NJTPA are both meant to provide a forum for interagency cooperation and public input into transportation planning. They sponsor and conduct studies, assist local county planning agencies and monitor compliance with national air quality standards.

NYMTC and NJTPA were created after the dissolution of a larger Tri-State Regional Planning Commission. The governors of New York, New Jersey and Connecticut established the Tri-State Transportation Committee in 1961. The Tri-State Regional Planning Commission was then formally chartered in 1965 as an interstate compact to continue planning for and operating regional transportation services and related facilities.

The Commission dissolved when the State of Connecticut withdrew from the interstate compact in 1982 (NYMTC, 2014). The dissolution of the commission prompted the created of eight smaller MPOs in the region, of which NYMTC and NJTPA are the two largest and most active.

Following the creation of NYMTC and NJTPA, there was an informal planning partnership called the Bi-State Forum to focus on transportation planning issues across the Hudson. NJTPA and New Jersey Transit were added to NYMTC's advisory membership in the 1990s. In the late 1990s, the Regional Transportation Planning Coalition was formed as a staff-level working committee involving NYMTC, NJTPA, two smaller New York MPOs and three MPOS in southwest Connecticut. A portion of this arrangement was formalized in January 2008 through an MOU among NYMTC, NJTPA and the three Connecticut MPOs, creating the Metropolitan Area Planning (MAP) Forum. The MAP Forum is a more formal level of coordination among the five MPOs in the production of planning products and analyses, coordination of specific studies and projects in boundary areas, and the maintenance of data and technical tools.

There are many working groups across the region that work on technical issues such as forecasting, air quality and the regional household travel survey. Other groups work on specific issues such as freight, or ferry service. There are also many ad hoc groups that form around specific issues, but there is no obligation on the part of other regional stakeholders to take part in these committees and groups.

6.3.13.1 RELATIONSHIP SUMMARY – NJTPA AND NYMTC

Collaboration	The two MPOs work together on the regional travel survey among other issues. Collaborate on long-term plans.
Conflict	No apparent conflict.
Knowledge	Both are knowledge hubs for the region, particularly with regards to travel data.
Perceived agreement	Appear to agree on most issues.
Perceived disagreement	No clear disagreement. Different focus based on definition of region.
Perceived Influence	Neither have significant influence in the region. Boards

	are made up of representatives from other stakeholders who hold decision-making power.
Affiliation	NJTPA is a non-voting member of NYMTC's board.

6.3.14 RAILROADS AND REAL ESTATE DEVELOPERS

Real estate developers are heavily involved in new plans for Penn Station. It is unlikely that significant physical change can happen at the station without the involvement of private real estate interests. This must be considered by the railroads and the states. A joint venture of Related Companies and Vornado were in control of development at Moynihan Station. Amtrak has not been heavily involved in the recent discussions regarding Moynihan Station, despite their future usage of the station. The project is managed by the Empire State Development Corporation and funded by private real estate interests. This project was complicated when the Governor of New York reissued the RFP for the Moynihan Project in early 2016. At the time of writing, there are no concrete plans for real estate involvement in significant changes at Penn Station; however Vornado is the primary owner of real estate surrounding Penn Station.

Real estate interests also affect how changes can be made. During the East Side Access project, tunnels had to be drilled deeply because existing real estate easements and very powerful owners made it difficult and expensive to do shallower construction.

6.3.14.1 RELATIONSHIP SUMMARY – RAILROADS AND REAL ESTATE DEVELOPERS

Collaboration	Real estate developers will enable significant change at Penn Station. As public entities, the railroads lack significant development capacity. Vornado owns significant storefront space in the current LIRR terminal. Vornado and Related Companies were in charge of development at Moynihan Station; the results of the new RFP remain to be seen.
Conflict	Alignment of values and dispersal of funds.
Knowledge	Each possesses specialized knowledge in their own area.
Perceived agreement	Mutual benefit for both parties based on a working relationship.
Perceived disagreement	No clear disagreement.
Perceived Influence	Real estate developers have the power of refusal, which

	could limit the potential for development at Penn Station.
Affiliation	Not part of the same venues for collaboration.

6.3.15 NEW JERSEY TRANSIT, LIRR AND AMTRAK – THE TRI-VENTURE

The three railroads operating at Penn Station have three separate operational heritages. LIRR started in 1834 and came into Penn Station in 1910. Amtrak was created in 1971 as an amalgamation of prior passenger service run by freight railroads. New Jersey Transit began commuter service in 1983 after acquiring all commuter railroad service in New Jersey from Conrail. In many ways, each of these railroads is still operating as private enterprises. Funding is a particularly thorny challenge because the railroads are still beholden to their constituencies and political overseers. Each of the railroads must respond to a different set of politics from New Jersey, New York or the federal government.

As the primary owner of much of the Northeast Corridor infrastructure, Amtrak controls much of the cost and financing of leasing agreements. Penn Station runs on Amtrak electric power and is charged based on a straight usage percentage. Amtrak also maintains the entire infrastructure at Penn Station, including the electrification systems. Amtrak and NJ Transit run on straight AC power, while LIRR runs on DC power (third rail); Amtrak maintains third rail in Penn Station.

Figure 6-5: The Tri-Venture area proposed by NJ Transit, LIRR and Amtrak ("TriVenture", n.d.)

The relationship between Amtrak, the commuter railroads and the state and federal government is not simple. The exchange of money is a complication. While the federal government created essentially a private operating system in Amtrak, all the capital money comes from the DOT, same as for commuter and freight rail.

The "tri-venture steering committee" is comprised of representatives of LIRR, Amtrak and NJ Transit and was created to bring the railroads together to address the joint need to maximize capacity at Penn Station and manage operations (Shechtman, Giuffra, Gossel, & Sherwood, 1998). The "Tri-Venture" was created in 1997 following a recommendation from STV, a consultant, on updating a 1992 report on "MTA Station Capacity and Utilization Analysis". STV recommended "creating a permanent 'tri-venture process' to discuss issues such as schedule changes, infrastructure improvements, and 'other initiatives' and continue to explore the advisability of operational changes to alleviate the joint operation bottlenecks" (RPM Systems Corporation, 2011). The Tri-Venture project brought together the railroads working at Penn Station in order to assess the state of good repair for an area that runs through the Hudson River tunnels into the Penn Station Area complex in Manhattan and through the East River Tunnels.

The railroads jointly funded a 1994 Update Study to a 1992 report on "MTA Station Capacity and Utilization Analysis". The initial report assessed capacity issues in Penn Station and presented proposals for managing future growth. It considered proposed changes to operations at Penn Station through 2005. The 1994 update took into consideration new studies conducted by LIRR into dual-mode (diesel and electric) locomotives and bi-level coaches, platform extensions and other factors. LIRR managed the study due to a previous existing relationship with the consultant, STV. Prior to the 1994 study, each railroad provided operational plans identifying service levels, operating slots, yard movements and train platform assignments.

The Tri-Venture first met on March 27, 1998 and was comprised of two or three individuals from each of the three railroads. The Tri-Venture area can be seen in Figure 6-5. The goal of the new committee was to develop and coordinate terminal operations at Penn Station, including schedule changes, current and future operations, and a uniform terminal timetable. They developed a joint train movement plan for Penn Station to facilitate smooth terminal operations and maintain reliable on-time performance.

Initial projects proposed by the tri-venture committee included changes to interlockings and platforms in order to reduce conflicts, as well as upgrading signaling systems. However, many of the initial proposals were never implemented. The original ARC project proposed taking on some of these projects, but this too was never implemented. Today the

Tri-Venture committee meets quarterly, according to an Amtrak official, to discuss Penn Station operations.

6.3.15.1 RELATIONSHIP SUMMARY – TRI-VENTURE

Collaboration	The railroads work together closely at Penn Station to keep it running. The Tri-Venture seems to be collaborative, but the power in the relationship is skewed.
Conflict	NJ Transit in particular feels that they lack power in the relationship at Penn Station due to lease and dispatching agreements.
Knowledge	All have specialized knowledge in running their railroads.
Perceived agreement	Agree that change is needed at Penn Station and that the Gateway Tunnels are a necessary project.
Perceived disagreement	Disagreement over split of power and influence at the station.
Perceived Influence	As the owner, Amtrak exerts influence over the other railroads and makes ultimate decisions.
Affiliation	The Tri-Venture and Penn Station are the primary venue of collaboration.

6.4 THE IMPLICATIONS FOR RECENT DEVELOPMENTS IN THE POLICY PROCESS

In order to deal with upcoming challenges in the region, there have been several proposals of new organizations to help manage them, but it is unclear whether these organizations will introduce change in how decision-making is managed, or whether they will simply act as new layers of bureaucracy.

6.4.1 GATEWAY DEVELOPMENT CORPORATION

The role of the Gateway Development Corporation (GDC) is to oversee the construction of the new tunnels under the Hudson River in a fair and equitable way.

The GDC will be housed in the Port Authority of New York and New Jersey, and is envisioned to be managed by a board made up of two PANYNJ representatives, presumably representing New York and New Jersey, an Amtrak representative and a representative from the USDOT. The new corporation will own the new assets, with perpetual easements for Amtrak and NJ Transit (PANYNJ, 2015).

New Jersey Transit in particular is concerned about whether this institutional set-up will properly represent their interests. According to a variety of sources, the PANYNJ works on New Jersey and New York projects relatively separately, with leadership appointed by the respective governors.

As it stands, the GDC will be run by representatives from different organizations, as opposed to a board looking at the broader interests of the region. Former New Jersey Transit representatives Martin Robins and D.C. Agrawal, have put forth a proposal similar to that of the GDC. Their proposal, however, is broader and would "reorganize the management of Amtrak's entire Northeast Corridor line in the New York area, including Penn Station. Shared management would give NJ Transit and the Long Island Rail Road more authority, which makes sense because they are the station's primary users, Robins said" (Rinde, 2015).

6.4.2 Empire State Station Complex

The Governor of New York, Andrew Cuomo, started releasing statements indicating a strong interest in the future of Penn Station in early 2016. The Governor's remarks appear to be separate from previous discussions about Gateway and other changes to Penn Station. Presumably this is not actually the case. It was first announced during his State of the State address. In this address, Cuomo proposed the largest construction program in the history of New York State including investment in air, rail, mass transit, and roads and bridges (Cuomo, 2016a). Cuomo stated, "Penn Station will be the nexus for all this increased capacity", estimating that traffic into Penn will double over the next fifteen years.

Cuomo stated that Penn Station is "un-New York" because it is "dark and constrained [,] ugly, dated architecture [,and a] lost opportunity".

The Governor's vision for the Empire Station Complex includes three components:

1) Redevelop Penn Station,
2) Build a new train hall ringed by shops and restaurants at the Farley Building (the future Moynihan Station), and
3) Link the two structures into one interconnected complex.

An initial contract for Moynihan Station/Farley Building redevelopment was awarded in May 2012, but 2016 brought questions about the future of the project and the ability of the chosen consortium to finish work. A new joint solicitation by the Empire State Development Corporation, Amtrak and MTA-LIRR was issued for redevelopment by a private developer. The private developer would finance Penn Station redevelopment in exchange for retail development rights.

6.4.3 New York State Design and Development Corp.

This was recently created by the New York State legislature in order to act as an advisory body for projects over $50 million by state agencies. There is no implementation power, and it appears as though the corporation may act as another layer of bureaucracy around projects; on the other hand, it may help to speed up projects. The MTA does not have a stellar track record for on-time delivery of major infrastructure projects, such as the Second Avenue Subway or East Side Access.

6.5 Summarizing Decision-making

Overall, there was a high level of skepticism from interviewees regarding the formal mechanisms for collaboration currently in existence. Each actor indicated that while Penn Station and the need for new trans-Hudson tunnels is an important issue, the current set-up makes it difficult to get things done. While they indicated high levels of familiarity at the individual employee level, there was skepticism of the ability of higher-level officials to create more regional or cooperative organizations.

There was consensus among actors, particularly the railroads and transportation actors, regarding the importance of challenges ahead, but it is unclear how to change how decisions are made and organizations work together. There is a strong understanding of the need for cooperation and of who should be involved, but existing systems for cooperation are not wholly effective. Much of the current methods for cooperation involve informal relationships hindered by a lack of cooperation at the executive level.

Access to shared knowledge was indicated as a challenge. Each organization maintains its own information, often in different formats. While much of the information is public information, it can be very difficult to get. There is a consistent regional traffic model maintained by NYMTC, but this does not necessarily translate to rail. The first official regional rail map was published in 2014.

It was very important to have personal networks among staff. It was indicated by several interviewees that formal opportunities for staff at different agencies to socialize or interact may help to increase collaboration. Knowledge sharing is seen as important, but knowledge is guarded as a negotiating tool. Many saw shortcomings in the consultations and integration of the different viewpoints into policy development. Concerns mentioned included ownership, financing and skepticism around trust. This was noted on an institutional level, but not necessarily on a personal level.

Decision-making in the New York region is currently highly fragmented; it appears that fragmentation in this region affects the delivery of projects, and the success of working across borders. While it may not be possible to rid the region of all fragmented decision-

making, there are opportunities to increase cooperation and make decision-making more effective across scales.

The following chapter puts forth recommendations for how to address the challenges discussed in this chapter.

7 PUTTING IT ALL TOGETHER

After speaking with twenty-five professionals from agencies and organizations across the City of New York, it is clear that while there are many challenges facing regional transportation governance in the City, there are many dedicated professionals who work to move projects forward and get things done. The metropolitan region is in need, however, of a mechanism to empower decision-making on a regional scale that incorporates the needs and interests of all stakeholders, including travelers and residents of the region.

Penn Station is not an isolated system; it is part of a broader regional and mega-regional transportation system, and decisions at Penn Station have repercussions across the city, metropolitan region and Northeast Corridor mega-region. Despite being a vital hub station, the current governance structure of the station and projects that affect it, such as the Gateway Program, are not designed to support either metropolitan or mega-regional, collaborative decision-making.

Despite a variety of efforts by operators and regional organizations to bring together stakeholders, it remains clear that through its ownership of the station, Amtrak has more power over decision-making than New Jersey Transit or Long Island Rail Road. New Jersey Transit service and riders are drastically affected by delays and potential limits on capacity across the Hudson River, while Long Island Rail Road riders are subject to similar, though on a less urgent timeline, uncertainty across the East River. Ridership from New Jersey is growing rapidly, but significant growth in capacity is limited, and service quality is uncertain due to broader factors outside of a single railroad's control.

This uncertainty is not just a problem for New Jersey Transit or Long Island Rail Road; there are broader repercussions across the region. Decreased rail capacity across the Hudson River may mean lower productivity for the hundreds of thousands of workers who cross via rail every day. Unreliability may lead commuters to choose private vehicles over rail, increasing congestion in Manhattan and at entry points to the city, such as the George Washington Bridge. These are only two examples of how changes in commuter rail travel across the Hudson can have ripple effects across the regional economy.

We put forth ten recommendations, of varying levels of complexity, in order to help address the needs of Penn Station, the traveling public, the New York metropolitan region and the broader Northeast Corridor mega-region. There recommendations are based on three main approaches:

1. Rethinking the institutional structures governing rail transportation in the metropolitan region and the Northeast Corridor mega-region,
2. Building leadership, trust and sustained partnership among railroads and other stakeholders, and
3. Improving the customer experience at Penn Station.

We have organized our recommendations into long-, medium-, and short-term actions and goals. We start with discussing the values and approaches we have used to generate our recommendations and then move into discussing long-term goals in order to provide guidance on the overall vision for governance, followed by medium- and short-term goals that we can begin with to work towards our vision.

7.1 Three Key Values Shaping our Recommendations

7.1.1 Rethinking the Institutional Structures Governing Rail Transportation in the Metropolitan Region and Northeast Corridor Mega-Region

Despite the best efforts of staff at the railroads and other important agencies and organizations across the region, there has been no effective way to coordinate decision-making at a regional scale. We will present opportunities that lie upon the path towards where an ideal regional governance structure, recognizing that this is an iterative process engrained within, and constrained by, many years of history.

It is important to consider the spatial hierarchies of the physical systems and decision-making. Many of the physical systems cross political and geographical boundaries, but decision-making does not. In order to address these challenges, we put forth four recommendations for rethinking the institutional structures governing transportation in the region. These recommendations vary in their timeframes and level of complexity, but are all oriented towards improving cooperation between key stakeholders and effectiveness of transportation provision at Penn Station and beyond.

7.1.2 Building Leadership, Trust and Sustained Partnership

Despite historical differences, collaboration among operators and stakeholders is one of the most important elements of improving the operations of Penn Station and the experience for customers traveling through it. Incremental changes to how decisions get made, staff and leaders work together and projects get implemented can help to continue to build trust and new cultural norms at all levels.

Nearly all of the individuals we interviewed indicated that one of the most important elements of getting work done at Penn Station is the individual relationship among

employees at the various railroads. At the staff level, many know each other and are able to reach out across organizational lines. However, many of these relationships are informal and rely heavily on personal networks; this presents a challenge should an individual leave an organization or leave the region. Additionally, while senior staff may know each other, our interviewees indicated that there is much more distrust and less willingness to work together at these higher levels.

Individuals make up an organization, and between individuals, there is often trust and personal relationships; however it is vital to also have trust and relationships at the institutional level. The reputation of an organization and its mandates to follow through and collaborate is vital to moving forward on major projects and avoiding delays. Creating a structure that facilitates honest communication, taking time to understand each other's positions, and coming to compromises is vital.

Successes, however large or small, should be celebrated publicly and jointly. Penn Station is viewed as a public asset, and many individuals feel ownership or attachment to the station.

7.1.3 Focus on Improving the Customer Experience

Decision-making is difficult at Penn Station because there are many stakeholders with competing objectives; each operator and actor at the station rightfully holds their own interests in mind when thinking about the station and this is reflected in the physical design and customer experience at Penn Station. Each stakeholder has many urgent needs to address; while Penn Station is functional, many of its needs are not urgent on the day-to-day timeframe. Despite this, there are many projects underway. However, increased strategic and long-term thinking about the station can help reprioritize the needs to the user and ultimate benefactors, and free up operator capacity to focus on other urgent needs.

It is important to look at transportation as a platform, and use a 'travelers-first policy'. While someday this is something to be looked at for the system, it can be implemented at the station level. Users see rail as a service. If it can operate more seamlessly, not only can it better support the growth of the region, but also perhaps encourage increased use of rail. As public agencies, the objective of all the railroads is to provide customer service and move as many people as possible.

A system with multiple operators does not have to result in a fragmented experience for a customer; roads operated by different entities connect seamlessly for drivers, and multi-operator airline trips can be made with one ticket. In other regions of the world, such as

Greater London, transit operators work together to look and operate like a single, unified network, without actually merging into a single operator.

7.2 Building a Long-Term Vision for Metropolitan Transportation Governance

1. Create a Regional Transportation Authority that Coordinates Existing Operators

Instituting an overarching regional transportation authority is a big challenge and is a long-term goal on the path of moving towards an ideal governance structure for transportation in the New York region. However, bringing together the MTA, Amtrak and New Jersey Transit under a single umbrella with operative horizontal connections between modes and services can enable truly regional travel and help address coordination and decision paralysis that currently characterizes decision-making. With no one party authorized to truly lead or make decisions, it is much harder to institute change. There is tremendous uncertainty regarding the funding of such an organization and from where it would derive its power. Crossing state boundaries, authorization, empowerment and funding will need come not just from the states themselves, but also from the federal government.

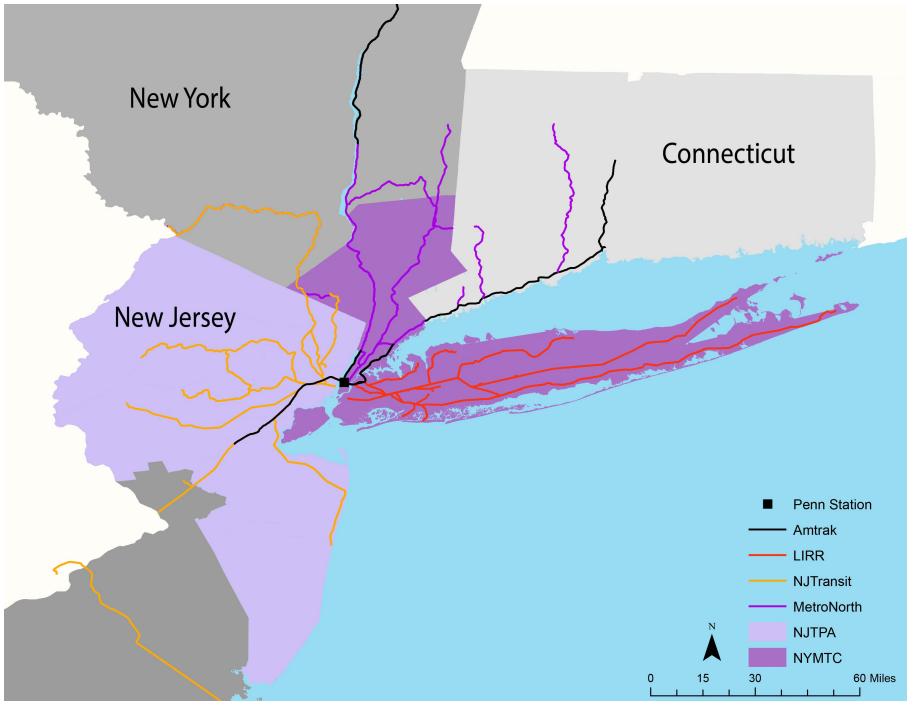

Figure 7-1: The New York Metro Area encompasses two main MPOs that do not cross state borders. Commuter railroads shown in red, purple and orange, with Amtrak in black.

Transportation in the New York region is overwhelmingly vertically integrated and vertically silo-ed, like transportation provision in much of the rest of the United States. Different sub-agencies operate distinct services with very little room for collaboration or horizontal integration. Rethinking the organizational strategy across the city may be a long-term solution, or a long-term pipe dream; instead it is important to think about how to make the existing structure function more effectively and incorporate the interests and needs of Penn Station users, and the regional population.

Thinking about the metropolitan region as a whole, and not in fragmented sections, issues beyond transportation can also be addressed. The growth of the regional economy includes future growth in businesses in New Jersey and Long Island, enabled by improved access by rail and public transportation; a resident of New Jersey should be able to commute to Long island and vice versa in order to enable this type of development. While there are not currently many trans-Manhattan trips, this is likely attributable to the lack of efficient transportation options, by rail or otherwise. It is unlikely that Manhattan will lose its place at the regional hub, but growth in business, housing and transportation options throughout the region can assure opportunity for all.

Despite the regionality of the economy and its transportation service, there is no true formal mechanism for regional collaboration or integration of routes, fares and schedules. There are many regional organizations that exist such as MPOs, the Northeast Corridor Commission and the Port Authority, but none are empowered to lead a regional transformation. A major question that exists is what led to this model in the United States, and what would be required to change it into a model that allows for increased regional collaboration and perspective.

When thinking about governance, it is necessary to think of three distinct levels of governance: policy, management and implementation. An overarching authority could be in charge of goals and objectives that overlap among operators, while operators could continue to serve their unique objectives. Operators become responsible primarily for implementation, while an overarching authority coordinates policy and management objectives.

In many European systems, there is an overarching authority that sets schedules, fares, routes etc. but contracts out service to a variety of operators. These operators may consist of both public and private agencies that operate a variety of services under the same brand. Cities where these operators run service, however, were often established before the presence of cars, affecting the urban fabric. As travel from New Jersey continues to grow, MNR service is brought to Penn Station and new services are introduced into the Northeast

Corridor, a *station management company* could help to prioritize access and space allocation at the station in the best interest of all users and operators.

Improving coordination and cooperation at the regional level through a truly regional transportation authority can lead to improvements in travel options, efficiency and passenger experience, which in turn can help to increase ridership and provide benefits for operators and passengers alike. Coordination does not mean eliminating operators; rather it means agreeing to improve the coordination and branding across the region to improve the user experience and improve service for customers, an important value for all.

This is a long-term change, but one that has proven itself elsewhere in the world, including with Transport for London and the *Verkehrsverbünde* in Germany, discussed in Chapter 2. We appreciate that there are significant differences - social, political, cultural and otherwise - between New York and other systems, but feel that these experiences can provide guidance to apply to the New York context. Significantly, in both the cases of London and the *Verkehrsverbünde* in Germany, the impetus for change at the regional level came from the federal government, but both cases also lack a strong government between the local and national level, such as the states in the United States.
In the examples of the Greater London Authority and the *Verkehrsverbünde*, a regional body procures transit services from operators and is in charge of coordinating management and administrative functions; both public agencies and private operators run services. Administrative or management functions that can be consolidated for efficiency and effectiveness should be housed at the regional level. In turn, increased connectivity has lead to increases in ridership and overall more effective service across the region. Consolidation of redundant administrative tasks can also reduce the expenditure on duplicate services and administration, allowing for more regional improvements, but bringing to light labor issues across the railroads.

In Germany, *Verkehrsverbünde* bring transport providers and government agencies together under a single umbrella and have two primary responsibilities: 1) developing a uniform fare structure, independent of transit providers, and 2) coordinating timetables and routes to reduce redundancy, service gaps and wait times (SPUR, 2015). In practice, this often takes the form of a series of fare zones radiating out from the city center, with a uniform fare structure shared by all operators in order to facilitate the ease of travel and increase travel options. Timetables and routes are coordinated to provide the opportunity to transfer between services efficiently, or are negotiated to see the benefits of through running service at Penn Station, running commuter service from New Jersey to Long Island and vice versa. The focus shifts towards creating an integrated service in the eyes of the traveler, regardless of who operates a given service. By improving accessibility throughout a region and building a denser network, government subsidies are used more effectively,

and in many regions, public transportation has gained a larger modal share (Koch & Newmark, 2016). Vital questions remain about budgeting and where funding for such an organization comes from, as well as how revenues are shared among operators.

A major challenge presented by creating a regional transportation authority is Amtrak, the intercity rail operator. Despite having a major presence in the metropolitan area and a big influence due to their ownership of much of the infrastructure, Amtrak is not wholly contained within the region. Critically, Amtrak also owns Penn Station, an important part of the commuter rail experience. Discussed later in this section, a new ownership model for Penn Station could be housed under the regional transportation authority.

MAKING IT HAPPEN

A major question to address is whether a regional transportation authority should be a new institution within the region, or whether it should be housed within an existing institution that has some influence on regional transportation. Further questions include ownership and control of infrastructure, and the integration of operations.

On the infrastructure side, currently Amtrak's ownership of Penn Station and much of the rail in the Northeast Corridor has given them de facto veto power and more control over decision-making and the future of Penn Station. Amtrak is not truly a state-owned company and are considered by some to be a sluggish organization under the thumb of Congress. This grey area of ownership, mission and financing has led to disagreements about cost-sharing and access to Amtrak-owned infrastructure.

A regional transportation authority can assure that there is an organization focused on how transportation provision provides what is best for the region, and not a single political entity or rail operator. Penn Station is just a component of a broader regional transportation network, including but not limited to rail service; thinking beyond the management of the station can also help to assure that the station operations run more smoothly and support broader regional goals.

In Germany, rail infrastructure is owned by the federal government, and railway infrastructure managers are legally required to be separated in organizational management and accounting from rail transport operators (Deutsche Bahn, 2016). Equal access to railway infrastructure by both private operators and public agencies is regulated by the Federal Agency for Electricity, Gas, Telecommunications, Post and Railway (BNetzA). BNetzA also regulates infrastructure fees and access charges.

The lessons learned in Germany include that the implementation of this new structure of public transport organization must come from the policy makers. In the New York case,

this would like be an initiative to come jointly from Congress, the governors and the mayors of the main cities. A key focus is that management and administration can be combined at a level above that of separate operational authorities.

In practice, a truly regional transportation or rail authority could look like a regional brand of transport with integrated decision-making, service standards, regulation and fare payment. There are opportunities to align with the elimination of the MetroCard and to create space for all services, potentially including Amtrak to be able to use the same payment system, if not yet the same fare structure. In the long-term, a move towards zone-based fares can incentivize trips in currently difficult-to-travel patterns; it is even possible to imagine the integration of a CityPass with Amtrak and commuter rail service, that would include a local transit ride (subway and bus) in the cost of an intercity ticket to promote transit usage and ease of use for customers.

There are three logical organizations already in existence that could house this type of regional transportation authority: 1) an MPO, 2) the Port Authority of New York and New Jersey, or 3) the Northeast Corridor Commission.

Metropolitan Planning Organization

By definition, an MPO would be a logical place to house a regional transportation authority, but given the existence of both NJTPA and NYMTC within the New York metro area, and the lack of capacity at the MPO level for this type of coordination and management, it may be worth looking elsewhere. For effective execution, an MPO should cover New York and New Jersey, as well as other portions of other states included in the region and needs to be empowered to make decisions. MPOs typically have low salaries and little expertise in managing large projects. MPOs may be better empowered to think about the local impacts of projects, such as land use and the use of land around stations, though they are not currently empowered to do so.

The Port Authority of New York and New Jersey

Created as a bi-state agency, the Port Authority already is empowered to work on issues within the region. However, the PANYNJ has historically been questioned for its political biases dependent on the positions of the governors of New York and New Jersey and their influence over board appointees. Its success can be highly dependent on the relationship between New York and New Jersey and the political will to cooperate. Additionally, it covers only a portion of the region, excluding Connecticut and Pennsylvania; depending on what regional definition is agreed upon, this may present a challenge.

Northeast Corridor Commission

The NEC Commission might be an organization in which to embed a regional government body that can think beyond politics towards what is best for the region. This entity incorporates the entire Northeast mega-region, however, which may dilute focus on regional issues within the New York Metro Area. It provides a forum for key institutions to get together and discuss crosscutting issues, but it may be too far removed from the metro region itself, and is not yet empowered to make the necessary decisions. Additionally, the staff of the NEC Commission is not designed to have the capacity for regional management of this type; additionally staffing and capacity building in any of these organizations would be necessary.

2. Demolishing Madison Square Garden

Madison Square Garden is a major impediment to true physical change at Penn Station. Many studies have noted that the columns supporting the venue are a major inhibitor to making platform level changes at Penn Station. Not only would demolishing the venue open up opportunities to rethink above ground space at the station, but it also provides opportunities to rethink the use of limited platform space by eliminating columns. The City of New York now controls the fate of Madison Square Garden since the City Planning Commission voted in 2013 to not grant MSG a permit in perpetuity, but only for a limited 10-year term.

7.3 Medium-Term Opportunities for Change

3. Through-running Commuter Service at Penn Station

The metropolitan region needs to be connected. Intercity rail runs through Penn Station, making the Northeast Corridor a connected corridor. At the metropolitan scale, however, the region is not connected; there are no opportunities to travel continuously throughout the region on rail. Even if the demand does not currently exist, this provides impetus for economic development. Through running may not provide large capacity benefits, but it is a conceptually important breakthrough in order to bring the region together. It has successfully been done on a modest scale with the "Train to the Game" to Meadowlands, with the cooperation of MNR and NJTransit running service on the New Haven Line through Penn Station onward to New Jersey.

With current operations New Jersey Transit trains run through Penn Station to the Sunnyside Yards in order to be stored for the afternoon peak; they run on Amtrak track under the East River. LIRR trains are stored in the West Side Yard in Manhattan just west of Penn Station; not many trains are turned at Penn Station, but none continue passenger service beyond the station in either direction. Capacity benefits of introducing through-running would be constrained due to limited passenger circulation at Penn Station from the concourse to the platforms and the continued dominance of Manhattan as a destination, but addressing operational and organizational barriers to through-running can be a project

paving the way for future long-term change and can help improve the capacity of railroads to work together and create opportunities for new economic development outside the core of Manhattan.

4. Creating a Station Management Organization

Separate from a regional transportation authority (but perhaps under its purview), a station management company can be an interim solution as broader regional organizational changes, such as a version of the GLA or Verkehrsverbund (referenced in Chapter 2) are considered. While services may not be branded as one, they can be better organized and focused on the customer needs.

A station management corporation should focus on the interests of the station and its users, customers and operators. It would help with:

- Wayfinding
- Cost allocation
- Timetable planning
- Platform allocation
- Control center operation
- Ticketing services

Operators continue running their service, but work with the management company to coordinate and provide seamless service. In Germany, over 5,000 stations are successfully managed by a subsidiary of the national rail company, Deutsche Bahn, called DB Station & Service.

In the current structure, Amtrak exerts far more influence at Penn Station than either of the commuter railroads, despite their larger ridership. While intercity rail is important for the region and the nation, the commuter railroads serve a vital purpose in connecting the region and reducing auto travel, beneficial for all.

Because Penn Station is where the interests of these railroads converge, there is no one entity concerned with how best to operate it with the considerations of the entire regional population or network. Instead operators are concerned with how to improve their own operations, rightfully so. However, this is not a zero-sum game – collaboration, coordination and negotiation can help to grow the pie (i.e. ridership), and help make better use of limited financial resources.

As Penn Station grows in importance as a destination and a neighborhood anchor with new development on the West Side at Hudson Yards, an impartial management company can help balance the needs of intercity, regional and local users and operators, as well as the economic implications of the station and its role within regional development. It can also help focus on what is beneficial for station users in terms of real estate development.

This idea has been discussed among the railroads previously as *One Penn Station*, the idea of one coherent management umbrella for the station. From conversations with officials from the major railroads, the plan got sidetracked by the events of September 11, 2001 and has not been picked up again.

MAKING IT HAPPEN

Similarly to the regional transportation authority, a decision that needs to be made is whether a station management company should be housed within an existing institution or organization, preferably one removed from rail operations, or whether it should be created as an outside and independent institution. Another vital question to be answered is whether Amtrak would or should continue to own Penn Station, or whether Penn Station should be under the ownership of a different organization.

There are two organizations currently in existence that may be candidates for becoming a Penn Station Management Company, the new Gateway Development Corporation and the Northeast Corridor Commission. Additionally, a station management company could be housed within a new and separate regional transportation authority umbrella organization.

Gateway Development Corporation (GDC)

The new Gateway Development Corporation, charged with building the new tunnels under the Hudson River, represents an opportunity to rethink how decisions are made in an equitable manner across state borders by being housed in the Port Authority. Not aligned with any operator, the PANYNJ operates on a mission of serving the interests of both states. How this plays out in practice is of concern to many though. As a new organization is formed that will already be thinking about operations and the role of Penn Station, there is an opportunity to transition into managing the station and tunnel infrastructure and operations.

However, NJTransit in particular has expressed fear about the balance of interests between states and organizations. While the board is anticipated to be made up of four members, one each from the Port Authority representing New York and New Jersey, one from Amtrak and one from the USDOT, the relationship between the state representatives of the Port Authority and the rail operators remains to be seen.

In the case of station operators, a question remains about the presence of an Amtrak representative; if the goal is to make decision-making truly operator agnostic, intercity or mega-regional interests may be best represented in another manner.

Also, the GDC is being housed at PANYNJ because they have significant construction experience; however, the PANYNJ has little experience managing major rail transfer stations and questions remain about whether the capacity exists to do so. However, as the organization is created to manage the Gateway Program, capacity can be built within the PANYNJ.

Housed within the PANYNJ, questions also remain about how to represent interests outside of New York and New Jersey, or whether they need to be strongly represented in the management of Penn Station.

Northeast Corridor Commission

A station management company could be part of this larger organization designed to manage the Northeast Corridor as a whole. It would be important for it to be able to consider the needs not just of the Northeast Corridor from Boston to Washington D.C., of which Amtrak is the major player, but also of a smaller sub region that is the New York metropolitan area.

5. Improving Physical Station Design with Customers in Mind

A station management company can also help move forward with the vision of a unified Penn Station. Particularly considering space allocation and usage post an Amtrak move to Moynihan station, there is a pressing need to think about how space is used. Physical space can be difficult based on how trains are currently allocated and challenges regarding technology such as train power systems. However, for customers, it is certainly not an integrated station and can be very difficult to navigate.

The station is the key point of contact between a rider and the rail network, and the station has a major impact on user experience. Improving the experience of transferring and traveling through Penn Station can help bolster long-term support for public transportation in the region.

Long-term, there emerges the question of MSG. The existence of MSG limits changes to vertical pedestrian circulation and the inability to use platforms to hold waiting passengers. These components of physical design limit how users experience the station.

7.4 Short-Term Projects to Spur Change

6. Clearly define the Region

There is no clear definition used by all stakeholders to define who needs to be involved in decision-making; this leads to confusion and gaps in representation for key decisions. Different organizations use different definitions for what makes up the New York region. A clear definition agreed upon by all key stakeholders can help clarify who needs to be at the table when making important transportation decisions.

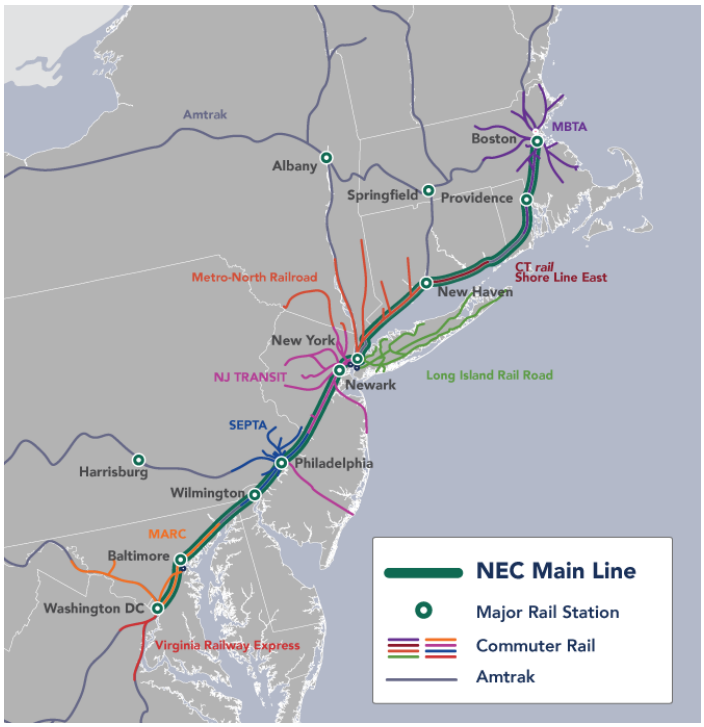

Figure 7-2: The Northeast Corridor. (NEC Commission, 2016)

Current regional definitions in use include:

- *Metropolitan statistical area (MSA)* – the U.S. Office of Management and Budget defines metropolitan and micropolitan statistics areas prior to each decennial census. Currently, the New York-Newark-Jersey City, NY-NJ-PA MSA includes 25 counties in New York, New Jersey and Pennsylvania. This region conspicuously does not include Connecticut.
- *Metropolitan planning organization (MPO) designations* – There are two main MPOs in the region, shown in light and dark purple in Figure 7-1, but neither crosses the state border. These regional planning bodies could be considered dividing the New York Metropolitan Area into two distinct regions.
- *Northeast Corridor* – The Northeast corridor, shown in Figure 7-2, runs from Washington, D.C. to Boston along the existing rail corridor. This corridor extends beyond the New York metro area, but Penn Station is at its heart. This region is important for high-speed rail and intercity rail planning.

- *Regional plan association (RPA) definition* – The RPA, a prominent civic group, defines the region as a 31-county tri-state area including counties in New Jersey, New York and Connecticut, shown in Figure 7-3. This definition was first used in the first "Regional Plan for New York and its Environs", published in 1929.

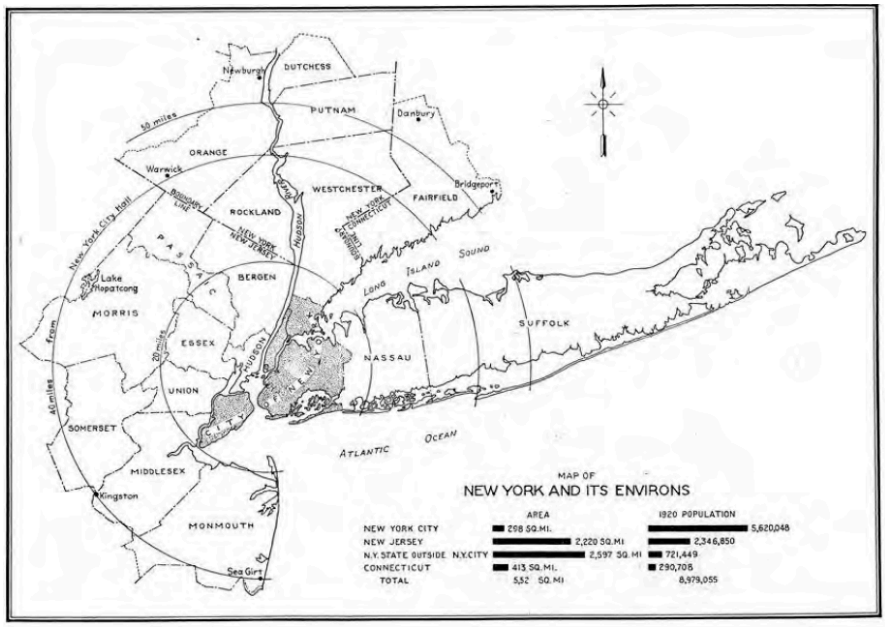

Figure 7-3: The New York metro area as defined by the Regional Plan Association in 1929, still in use today.

We recommend that the region encompass the extent of the New Jersey Transit, Long Island Railroad and Metro-North Railroad systems. These radiate out from New York City and are an important contributor to the New York City workforce. However, strong consideration also needs to be given to the local residents of New York City who are not strongly represented in many discussions because they do not use these systems. Amtrak also must be involved as a regional stakeholder, but because they run beyond the boundaries of this new region, an agreement must be reached on what type of influence they will have. The five railroads (Amtrak, NJTransit, LIRR, MNR and New York City Transit) also need to be taken into consideration in regional decision-making despite their differences in usage.

7. Introduce Structures and Policies to Build Formal Relationships at all Levels

The current reliance on informal, personal relationships among staff at different agencies makes the connections between agencies tenuous. Although there is a very connected professional network within the City of New York across public, private and advocacy

sectors, the loss of one employee could set a project back should their replacement not have the interest or the same level of engagement with their professional network.

While agencies should continue to support professional engagement of employees within the transportation field in New York, opportunities should also be taken to provide professional development and networking opportunities across agencies in the region.

At both junior- and senior-levels, more formality in relationship building could help to ensure the longevity of relationships and help to build trust among different organizations. A move towards a partnership model between railroads, instead of a landlord-tenant model, may help to bring forward more equally the interests of all in the region and all the railroads operating at Penn Station.

While there may be informal connections at senior executive levels across the organizations, it can be more difficult for senior staff to be able to use these types of connections to make high-level connections. It is important to think about how staffs at different organizations interact across all levels.

While previous attempts from senior executives to gain a true opportunity to share ideas and collaborate outside of formal venues have not been successful, getting senior level buy-in from both the railroads and the state and local government officials is vital to improving trust and changing engrained organizational cultural norms. Senior management should be empowered to come together in a space without consequence to think through difficult regional questions. They should also empower their staff to engage effectively and creatively across agency lines.

Some possible means to help build more formal relationships include:

- Senior leadership retreats and brainstorming without consequences
- High-level authorization for staff to engage effectively with their peers
- Formal networking and engagement opportunities for staff across multiple agencies
    - Professional development
    - Project sharing
- Holding a regular conference of operators and their staff open to employees across levels and departments

8. Run Pilot Projects at Penn Station to Test Changes

Pilot projects at Penn Station can help make change real and make clear to people that the transportation operators are thinking about their experience and needs. For those using Penn Station day-to-day this type of engagement may not be clear and may lead to frustrations with operations, despite operators knowing that maintaining day-to-day

operations can seem to be a feat in itself. Pilot projects can help test ideas, try out new means of cooperation, and can help prove the effectiveness of projects that other stakeholders, such as labor unions, may be skeptical of.

The City of New York and the NYC Department of Transportation have expertise and experience in running pilot projects aimed at rethinking the use of space. These agencies can be important partners as the railroads venture into this space.

Possible pilot projects could include:

- Instituting and testing new means of wayfinding,
- Offering ticketing for all railroads in central locations,
- Using new methods of boarding passengers and announcing train arrivals, or
- Activating empty spaces within the station using furniture or other programming

These types of opportunities can help improve the traveler experience through the station. Jointly, the railroads can understand the overall needs of passengers, both intercity and commuter, as well as the key pain points that users experience while at the station. This type of shared information can help provide information to travelers about the region's rail system, how to use it, and what its value is while working towards addressing the most glaring physical design issues.

INTEGRATED WAYFINDING

While there has been significant discussion about improving wayfinding at Penn Station, few changes have been made. The station is maze-like and could benefit from very clear signage about the location of platforms and exits, as well as the connections between operator areas.

Additionally, there should be clear, consistent and ample information about transit options across the region. Care should be taken to promote and continue to develop a great regional transit map; it should be made more public and widely available than the map created in 2014 and 2015, shown in Figure 7-4 to show regional connections.

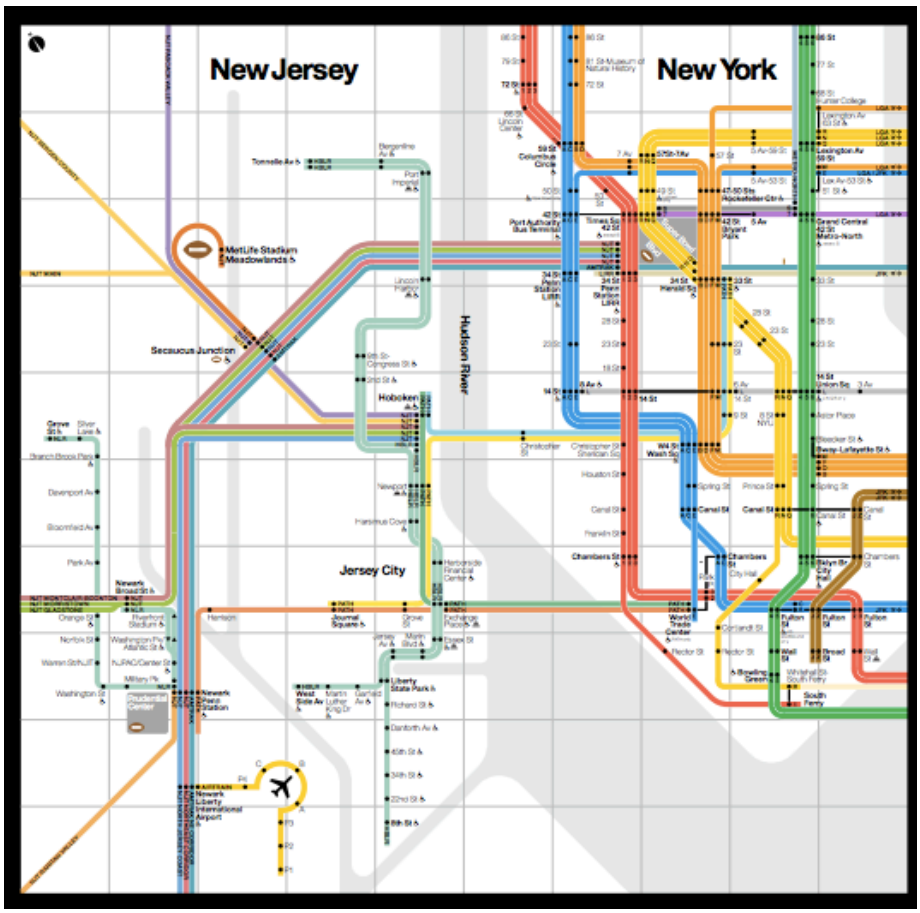

Figure 7-4: Regional Transit Diagram created by the MTA in 2014 and 2015. (MTA, 2015)

INTEGRATED PASSENGER WAITING SPACES

While one challenge of integrating passenger waiting spaces is vertical circulation within the station. When thinking about where passengers can wait and where they can access different sections of the platform, access should be provided from multiple locations, if possible.

INTEGRATED TICKETING

Ticketing should be available at any location across any system. Additionally, collaboration between the commuter and intercity rail operators, and NYCT to provide a type of "city-ticket", or one free ride on the subway if you purchase an intercity ticket, could help integrate service and encourage use of all rail modes. Over time, standardized fares and a zone-based fare system can unite the regional transportation network. In the meantime, however, making it easier to purchase tickets for all systems can e a start.

Integrated ticketing should be aligned with changes to the MetroCard and the introduction of a smartcard. Lowering the barriers to use of rail will help to encourage greater use of the regional rail network, and can have consequences across the broader transportation system by removing cars from the roads.

There may be potential pushback from operators and from labor unions. Careful consideration must be given to working with unions on any changes regarding integration and to think through the implications for employment.

ACTIVATING UNDERUSED CONCOURSE SPACE

Despite the crowded conditions in some parts of the station, there are corridors that are underused, particularly due to the train arrival announcement system in place that forces riders into a few waiting spaces. There have been attempts to activate them through commerce, such as a wine shop in one of LIRR's underused corridors, but these have not had much success.

9. BUILD CAPACITY WITHIN AGENCIES TO ENGAGE REGIONALLY

In order for individual agencies to effectively engage regionally, it will be necessary to grow new capacity internally to address and improve the regional travel experience. Each agency will need to have the capacity to effectively use and share operational and customer data, and have the authority to engage on regional issues. Some necessary steps to facilitate regional engagement include:

- Establishing business and data leaders at MPOs and transit operators
- Increasing the collection, sharing, analysis and use of transit data at the operator level
- Creating a regional data clearinghouse, perhaps housed at NYMTC which already collects and disseminates the regional travel model, and enforcing data standards
- Establishing customer experience leaders at transit operators that can engage independently
- Establishing a point person or department for evaluating integration efforts and sharing findings

10. ENGAGE MORE DIRECTLY WITH THE CITY OF NEW YORK

Despite Penn Station's location near the heart of Midtown, the City of New York has little say over what happens in or around the station. As the City contributes more money to the MTA's capital program, there is an increasing interest in better representing the City's interest in MTA investments. Given Amtrak's ownership of the station and the MTA's position as a state agency, there has been little room for the City to engage. However, increased engagement with the City cannot only help to improve relationships, but also engage their expertise in pilot projects. Additionally, offices such as the Mayor's Office of Data Analytics or Office of Operations could lend a unique perspective on new types of projects or processes that could benefit the station.

7.5 MAJOR OBSTACLES REQUIRING FURTHER WORK

There are many short-, medium- and long-term opportunities to improve the effectiveness of rail transportation in the New York Metro Area and at Penn Station. However, there are major challenges that exist that warrant further work and research. We will briefly discuss what questions remain unanswered.

1. FUNDING

A major obstacle that cannot be ignored is that of funding. There are many different funding sources, some of which are available only to a few stakeholders, or which railroads compete for despite operating in different corridors. The mismatched timelines of some funding sources, such as the FRA and FTA funds complicates matters and can make it even more difficult to sustain agreements between the state, federal, and local levels. FHWA and FTA funds must go through the MPO, while FRA funds do not have to. Federal funding from Congress is often very silo-ed for specific projects or portions of projects as well.

Questions to be investigated is what the best sources of funding are for improvement projects, who is empowered to use it and what incentives are there to create useful funding pools for future projects. It is also not clear where opportunities like a regional transportation authority or a station management company would derive their funds from.

Incorporating Private Interests

Private interests can be leveraged to help fund improvements to the stations and further connections. There is significant investment and growth at Hudson Yards, west of the Station, shown in Figure 7-5. Served only by a new stop on the 7-line subway, Penn Station offers an opportunity for significant transportation connections. By banding together and presenting a united front, railroads can also be in a stronger negotiation position with powerful real estate developers.

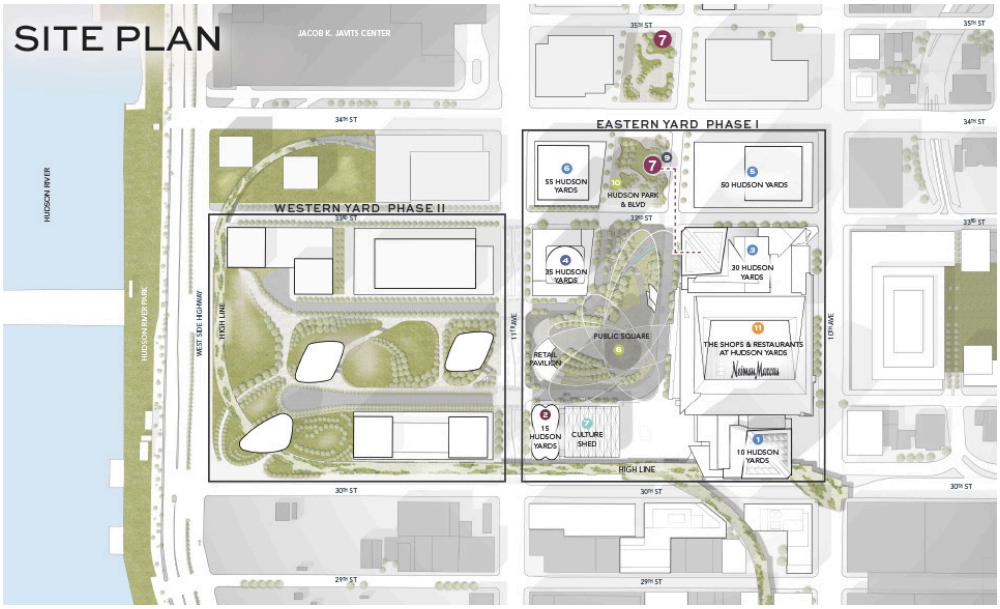

Figure 7-5: Hudson Yards Proposed Site Plan. Penn Station lies to the east of the site. (Hudson Yards, 2016)

Advocating for Federal Spending

Federal funding is also a strong option for projects at Penn Station, as confirmed by the Gateway Program. Maintaining access to NYC is an important national project, and thus the federal government has significant interests in ensuring that the project is done in a timely and efficient manner.

2. INCENTIVES

An important piece of the puzzle is what incentives are there for developers, operators and all levels of government to cooperate and fund change. There is currently no lead agency to design these incentives, or to understand the perspective of all stakeholders in order to look at synergies that exist between interests that can benefit all by working together. Further work needs to be done into how to facilitate cooperation and long-term change.

3. ORGANIZED LABOR

Every operator has its own labor unions, which have presented hurdles in the past to integration. Unions negotiate with rail operators on the terms of their contract and a threat to the number of jobs that may come with increased coordination and cooperation would be a very difficult negotiation. Unions have been against through-running at Penn Station in the past because of unclear rules regarding labor when running on two different systems. Recent possible strikes by New Jersey Transit and LIRR workers have been primarily over issues of wages and health care contributions. NJTransit workers are represented by 11 unions, while 8 different unions represent LIRR workers. Unions are

also strong electoral influencers, and have been important to both Mayor De Blasio and Governor Cuomo.

4. PHYSICAL DESIGN

Addressing the physical design challenges at Penn Station is no small task, and there is significant uncertainty regarding the future of Madison Square Garden and the columns that support it. In the meantime, however, there are changes that can be made, such as wayfinding and ticketing mentioned above, that could help to make the station easier to use.

5. POLITICS

Penn Station is an inherently political entity, particularly because its key stakeholders straddle state borders and the station has an impact nationally. Future gubernatorial and mayoral elections will have a major impact on decision making at Penn Station, as will federal elections and future decisions regarding funding. Transportation needs to be a priority for future political leaders, but it is not clear whether this will happen, and how to make it happen.

8 CONCLUSIONS

Regional transportation governance in the New York metropolitan area is not ideal; there are thousands of dedicated professionals working to keep systems running, but institutional differences are preventing the realization of much needed change. This thesis brings together opinions and information from disparate sources from across the region in order to understand the high-level picture of regional transportation governance in the New York metropolitan area, and to understand multi-scale governance challenges, the interaction of local and metropolitan transportation with intercity rail in the Northeast corridor mega-region. We make recommendations for long-, medium- and short-term changes to governance in the region and at Pennsylvania Station in order to break down institutional barriers and achieve the ultimate goal of moving people across the metropolitan area, and mega-region.

New York's Pennsylvania Station is the physical space where complex relationships between institutions play out in the Northeast Corridor and the New York metropolitan region. Decisions made by players with a stake in Penn Station have broad repercussions across the region, affecting how people travel and how business can be carried out. The Gateway Rail Tunnel Project to add redundancy and resiliency by building two new rail tunnels under the Hudson River requires cooperation between commuter and intercity rail operators and federal, state and local governments.

This work was motivated by the possible impact of high-speed rail coming into the Northeast Corridor. While the eventual fate of this project is uncertain, what is certain is that the corridor, particularly at Penn Station and the Hudson River tunnels, cannot handle this volume of new traffic with the existing infrastructure. The biggest challenge facing the New York metropolitan region and the Northeast Corridor in regional transportation is the deterioration of the Hudson River tunnels. These tunnels are critical to the economic success of the region, and to preventing gridlock in the City itself.

Existing transportation governance structures, siloed within states, modes and institutions, are ill suited to govern across borders and address issues across multiple scales of transportation service delivery. Relationships between railroads, politicians, travelers, the private sector and civil society play out at Penn Station everyday as passengers navigate three stations housed under one subterranean roof.

Additionally, socioeconomic effects of regional plans and projects are impacted by high travel costs and lack of fare integration, issues related to, and key for, regional governance and cooperation. New governance structures or methods of cooperation are needed not only to ensure the feasibility of operations and integration with existing transportation networks, but also to ensure that systems can adapt to changing demand and travel patterns, and continue to provide social and economic benefits across socioeconomic and spatial divides.

In order to continue to adapt and facilitate future growth in the region, we recommend moving towards a true regional transportation governance structure, an umbrella structure with implementation and convening power that can house existing operators, similar to structures in existence in London and across Germany and Japan. Current regional structures, particularly the metropolitan planning organizations, lack convening and implementation power, and play only a small role in decision-making on regional rail issues. The federal government created MPOs in order to facilitate metropolitan decision making on transportation, but left the form up to state and local officials; in a region divided by a state border, the MPOs, New York Metropolitan Transportation Council and North Jersey Transportation Planning Authority, work together to make a regional long-term transportation plan, but play little role in the ultimate implementation. Additionally, Amtrak, the intercity rail operator, cuts across governance boundaries and has no clear role or obligations in metropolitan governance.

As the demand for metropolitan rail grows, Amtrak's ownership of Penn Station highlights the tension between intercity and commuter rail; New Jersey Transit and Long Island Rail Road seek to increase their capacity and provide more one-seat rides into Manhattan while Amtrak is looking towards high-speed rail and connecting cities across the mega-region. Both NJ Transit and LIRR are state agencies, under the direct influence of their respective governors, Chris Christie and Andrew Cuomo. The mayor of New York, Bill de Blasio, has little influence over rail in the city, be it local, metropolitan or intercity.

While changing the structure of regional governance is a long-term goal, one that will take the cooperation of the railroads as well as the states and the federal government, a smaller scale intervention is to bring station management and ownership under a neutral party better positioned to coordinate operations. Currently operations and dispatching at Penn Station is disjointed, with LIRR and Amtrak sharing control of the Penn Station Control Center, and Amtrak dispatching NJ Transit's trains. A company whose mission is to provide the best service at Penn Station and to schedule, manage and dispatch according to regional demand can help to make the station operate better for everyone, and coordinate station operations as well, ridding the station of its disjointed feeling and divisions among operators that affect the passenger experience.

In the short-term, there are opportunities to begin projects that can test new methods of cooperation and of increasing joint decision-making while benefitting all parties. Possible opportunities include joint professional development among railroads to strengthen ties between agency staff, and pilot projects at Penn Station focused on wayfinding and ticketing. These types of pilot projects can not only improve the traveler experience at Penn Station, but could also help improve the relationship with the City of New York. Departments across the city, including the Department of Transportation, have experience running pilot projects to improve the use of space and wayfinding, and this experience can benefit the railroads, help to improve the relationship with the City, and provide an opportunity to try out new methods of cooperation within the station.

It is clear that regional transportation governance in the New York metropolitan area is not ideal, but that the individuals working in local, metropolitan and mega-regional transportation are committed. We have presented several recommendations that could be implemented moving forward in order to reach a better regional governance structure, but there remain major questions still to be considered.

These questions include: should we innovate within the existing system, or is it time to scrap the whole thing? Would it even be possible to start anew? Would travelers in the New York metropolitan region be better served with a completely different governance structure across all levels? Who is capable of providing service, and what political structures are necessary to facilitate this service? The role of the federal government in convening actors across state borders is still unclear; should regional planning and governance be led by federal initiative? The USDOT was able to solve an initial gridlock between the Governors of New York and New Jersey on funding the Gateway Tunnels, but their ultimate role beyond funding is still unknown.

We have chosen not to address the structural challenges that may be facing local, state and federal political structures in the United States, but instead focus on how to make change within the existing structures. Creating a regional governance structure as proposed in Chapter 7 is not a radical idea; it exists in London, and across Germany and Japan. But making it happen in New York is a challenge.

Many people on the ground have an understanding of what needs to be done, but are not empowered to do it. The presence of state borders and historically divided transportation agencies means that there needs to be a structure and mandate from above to implement changes. Political interference in projects has prevented change from happening, and has impacted radical change from taking place; new governance structures are needed that do not focus on a single mode or system, but rather focus on the metropolitan region as a whole and have the ability to interface with the Northeast Corridor mega-region.

The federal government attempted to put in place regional governance structures through metropolitan planning organizations, but did not specify how to define the metropolitan area it plans for, or how to deal with issues that cross state borders. The federal government may need to step in to overcome the challenge of the state borders, but overcoming the legal challenges of a state's right of self-determination is daunting. To what extent should the federal government play a role in local and regional issues that have ripple effects across the country? Beyond politics, the question remains of how Amtrak should be incorporated into future regional governance structures, and how power at the federal level affects local and regional outcomes.

Ideological and value differences are driving the current political discussion in the United States; while many of these values are more fundamental than transportation, this debate will impact how the future of public transportation, and public funding, looks. Additionally, changes on the ground in New York City are happening quickly; while the details of information presented in this thesis may soon be outdated, the fundamental questions and structures to understand cooperation and decision-making remain relevant. We must acknowledge that the ongoing deterioration of the Hudson River tunnels needs to be quickly addressed, and that the actions of the near future will play an enormous role in what the future of rail travel in New York City, the metropolitan region and the Northeast mega-region will look like.

Future work in this area can be thought of in two categories: work being done on the ground in New York City, but also further academic work that can address broader question of regional governance. Given more time, the author would have liked to explore in more detail how different forms and structures of regional governance from across the world could be applied in an American, and New York, context. This thesis touches on possible examples including the case of London, and of regional transport in Germany, but does not suggest what these structures applied in the New York metro area would truly look like. The challenge of multi-scale governance and the relationship between subway, commuter rail and intercity rail has been explained in this work, but the impact of change has not been deeply explored.

Additionally, there is further work that could be done about how through-running, running trains from New Jersey to Long Island would look not only from an operational perspective, but also how it could be governed and what role labor unions would play. The operational side of the question is relatively straight forward, but the governance and institutional challenges would provide great fodder for further inquiry. Organized labor is an enormously influential stakeholder in transportation provision that we have only touched upon in this work; understanding the perspective of the involved unions, as well as their

current and past role could help to inform how a transition towards a new governance structure can occur. Underpinning all of this is the question of economic impact; would a new approach or new relationships have a tangible impact on the regional and national economy? We have only hinted at the impacts, but understanding more clearly the economic impact of the Gateway tunnels and commuters to New York City, as well as the impact of connectivity could serve to push this work forward.

Penn Station and the Gateway tunnels impact the local and regional scales, but also the federal perspective towards large-scale public transportation infrastructure, the feasibility of high-speed rail and other forms of intercity rail and their relationship with metropolitan rail, and possibilities for new regional governance structures moving forward. We look forward to seeing the future of Penn Station and Gateway unfold.

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The author is pleased to report that she'll be joining the league of transportation professionals in New York City working to address these types of challenges. This thesis has served not only to explore these broad questions regarding governance structures and cooperation from an academic perspective, but also as an introduction for her to working in transportation in New York.

With that, we end how we began. Thank you for reading.

> *"With one or two exceptions, no government structure or means of governance is in place to allow for democratic decision making across the real community, and there is no constituency for these emerging regional communities. The problem is that there are regional problems and local governments" (Royer, 1992).*

9 CITATIONS

Abbott, J. (2005). Understanding and Managing the Unknown The Nature of Uncertainty in Planning. *Journal of Planning Education and Research*, *24*(3), 237–251. http://doi.org/10.1177/0739456X04267710

AKRF, Inc. (2006). *Moynihan Station Final Environmental Impact Statement*. Empire State Development Corporation. Retrieved from http://www.esd.ny.gov/subsidiaries_projects/msdc/MSDC_FEIS.html

Alberts, H. R. (2013, May 29). Four Plans For A New Penn Station Without MSG, Revealed! Retrieved May 11, 2016, from http://ny.curbed.com/2013/5/29/10238978/four-plans-for-a-new-penn-station-without-msg-revealed

Alpert, L., Gainsborough, J. F., & Wallis, A. (2006). Building the Capacity to Act Regionally: Formation of the Regional Transportation Authority in South Florida. *Urban Affairs Review*, *42*(2), 143–168. http://doi.org/10.1177/1078087406291591

Amtrak. (2011, February). *Gateway Project*. Retrieved from https://www.amtrak.com/ccurl/97/493/Gateway%20Tunnel%20Project.pdf

Amtrak. (2014, October 27). Amtrak Ridership and Revenues Continue Strong Growth in FY 2014.

Amtrak, & LIRR. Pennsylvania Station New York Joint Facility Agreement, § Reel 1445 (1988).

Amtrak, & MTA LIRR. Penn Station Central Control Joint Venture Agreement, § Reel 1445 (1988).

Arco, M. (2016, April 16). Christie to Dems on N.J. transportation funding crisis: You solve it. Retrieved April 27, 2016, from http://www.nj.com/politics/index.ssf/2016/04/christie_responds_to_dot_commissioner.html

Bagli, C. (2015, December 14). Cuomo Considers Reset for Long-Delayed Penn Station Expansion - The New York Times. Retrieved March 4, 2016, from http://www.nytimes.com/2015/12/15/nyregion/cuomo-considers-reset-for-long-delayed-penn-station-expansion.html?ref=nyregion&_r=1

Barro, J. (2015, January 27). Shutting Down New York's Subways Is Very Expensive. *The New York Times*. Retrieved from http://www.nytimes.com/2015/01/28/upshot/shutting-down-new-yorks-subways-is-very-expensive.html

Boyle, J. (2011, November 26). Greater Philadelphia Bicycle News: New Jersey Transit - The Way To Go Without Your Bicycle. Retrieved from http://blog.bicyclecoalition.org/2011/11/new-jersey-transit-way-to-go-without.html

Bram, J., & McKay, A. (2005). *The Evolution of Commuting Patterns in the New York City Metro Area* (No. Volume 11, Number 10). Federal Reserve Bank of New York.

Bremner, C. (2015, June 27). Grubby Gare du Nord gets £1bn facelift | The Times. *The Times*. Europe. Retrieved from http://www.thetimes.co.uk/tto/news/world/europe/article4481157.ece

Brennan, J. (2014). The New York Subway Diagram.

Brenner, N. (2003). Metropolitan Institutional Reform and the Rescaling of State Space in Contemporary Western Europe. *European Urban and Regional Studies*, *10*(4), 297–324.

Brotchie, J. (1991). Fast rail networks and socio-economic impacts. In *Cities of the 21st century: new technologies and spatial systems* (pp. 25–37).

Brown, E. (2015, April 7). Vornado Could Give New York's Penn Station Area New Lease on Life - WSJ. Retrieved March 4, 2016, from http://www.wsj.com/articles/vornado-could-give-new-yorks-penn-station-area-new-lease-on-life-1428421290

Broyles, S. (2012, May 8). Penn Station and the Rise of Historic Preservation. Retrieved from http://blog.mcny.org/2012/05/08/penn-station-and-the-rise-of-historic-preservation/
Calthorpe, P., & Fulton, W. (2001). *The Regional City* (4th ed.). Island Press.
Campbell-Dollaghan, K. (2014, March 19). How NYC's Newest Neighborhood Will Float Above an Active Train Yard. Retrieved May 11, 2016, from http://gizmodo.com/how-nycs-newest-neighborhood-will-float-above-an-activ-1546127069
Campbell, J. (2016, February 24). DiNapoli: New York finances "much improve." Retrieved April 25, 2016, from https://www.scribd.com/embeds/300294531/content
Carruthers, J. I., & Ulfarsson, G. F. (2002). Fragmentation and sprawl: Evidence from interregional analysis. *Growth and Change*, *33*(3), 312–340.
Castells, M. (1977). *The urban question*. Cambridge, MA: MIT Press.
CBO. (2003). *The Past and Future of U.S. Passenger Rail Service* (CBO Study). Congressional Budget Office. Retrieved from https://www.cbo.gov/sites/default/files/108th-congress-2003-2004/reports/09-26-passengerrail.pdf
Ceder, A., Chowdhury, S., Taghipouran, N., & Olsen, J. (2013). Modelling public-transport users ' behaviour at connection point. *Transport Policy*, *27*, 112–122. http://doi.org/10.1016/j.tranpol.2013.01.002
Cenizal, C. (2015, June). Governing the Metropolis: The evolution of cooperative metropolitan governance in Mexico City's public transportation. Massachusetts Institute of Technology, Cambridge, MA.
Centre for Civic Governance. (2015). *Transportation Governance, 12 Case Studies*. Centre for Civic Governance. Retrieved from http://www.civicgovernance.ca/wordpress/wp-content/uploads/2015/09/Transportation_Governance_FINAL.pdf
Chernetz, J. (2016, April 8). NJ Transit: New Director, Same Old Deficit | Mobilizing the Region. Retrieved from http://blog.tstc.org/2016/04/08/nj-transit-new-director-same-old-deficit/
Chien, S. I.-J. (2005). Optimization of headway, vehicle size and route choice for minimum cost feeder service. *Transportation Planning and Technology*, *28*(5), 359–380.
Cigler, B. A. (2001). Multiorganizational, multisector, and multicommunity organizations: Setting the research agenda. In M. P. Mandell (Ed.), *Getting results through collaboration: Networks and network structures for public policy and management* (pp. 71–85). Westport, CT: Quorom.
City of New York. (2016). Office of the Mayor | Mayor's Bio | City of New York. Retrieved April 27, 2016, from http://www1.nyc.gov/office-of-the-mayor/bio.page
Clever, R. (2006). Airport and Station Accessibility as A Determinant of Mode Choice. University of California, Berkeley.
Clever, R. (2011). The Last Mile Falling Through the Cracks - A Case Study of the San Francisco to San Jose Section of the California High Speed Rail System. Presented at the 90th Annual Meeting of the Transportation Research Board, Washington, DC.
Connor, P. (n.d.). Railway Station Design. Retrieved April 12, 2016, from http://railway-technical.com/stations.shtml
Cuomo, A. (2016a, January). *Built to Lead*. State of the State.
Cuomo, A. (2016b, January). *Empire Station Complex*. Retrieved from https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/EmpireStationComplex.pdf
Cuomo, A., & Labate, M. B. (2016). *FY 2017 Capital Program and Financing Plan*. New York State. Retrieved from https://www.budget.ny.gov/pubs/executive/eBudget1617/capitalPlan/CapPlan.pdf
Dacko, S., & Spalteholz, C. (2014). Upgrading the City: Enabling intermodal travel behaviour. *Technological Forecasting & Social Change*, *89*, 222–235.

Department of Water Resources. (2013). Strategic Plan for the Future of Integrated Regional Water Management in California.
Deutsche Bahn. (2016, March 16). Regulatory environment: Germany. Retrieved April 21, 2016, from http://www1.deutschebahn.com/ecm2-db-en/ir/dbgroup/regulatoryenvironment/1502892/germany.html
Downs, A. (1994). *New visions for metropolitan America*. Washington, DC: The Brookings Institution.
Eno, & Transit Center. (2014). Getting to the Route of It: The Role of Governance in Regional Transit. Eno Center for Transportation.
ESDC. (2014). Moynihan Station Development Corporation: About the Project. Retrieved May 11, 2016, from http://esd.ny.gov/Subsidiaries_Projects/MSDC/MSDC.html
Evers, D., & de Vries, J. (2013). Explaining Governance in Five Mega-City Regions: Rethinking the Role of Hierarchy and Government. *European Planning Studies*, *21*(4), 536–555. http://doi.org/10.1080/09654313.2012.722944
Feiock, R. C. (2013). The Institutional Collective Action Framework. *Policy Studies Journal*, *41*(3), 397–425. http://doi.org/10.1111/psj.12023
Ferreira da Cruz, N. (2016, January 8). Personal Interview.
Fitzsimmons, E. G. (2015, September 24). Tensions Build as M.T.A. Chief Keeps Pressing New York City for More Money. *The New York Times*. Retrieved from http://www.nytimes.com/2015/09/25/nyregion/mta-chief-adds-pressure-on-new-york-city-for-more-funding.html
Fitzsimmons, E. G., & Burns, A. (2015, October 10). New York City and State Reach Agreement on M.T.A. Capital Plan. *The New York Times*. Retrieved from http://www.nytimes.com/2015/10/11/nyregion/new-york-city-and-state-reach-agreement-on-mta-capital-plan.html
Fleishman, D. (2010, March). *Transit Fare Policy, Structure and Technology*. Presented at the Transit Management Course, MIT. Retrieved from http://ocw.mit.edu/courses/civil-and-environmental-engineering/1-258j-public-transportation-systems-spring-2010/lecture-notes/MIT1_258JS10_lec12.pdf
Florida, R. (2014, March 12). The Dozen Regional Powerhouses Driving the U.S. Economy. Retrieved May 1, 2015, from http://www.theatlanticcities.com/jobs-and-economy/2014/03/dozen-regional-powerhouses-driving-us-economy/8575/
Freemark, Y. (2005a, August 24). Friends of Moynihan Station. Retrieved March 4, 2016, from http://www.moynihanstation.org/newsite/2005/08/moynihan_station_animation.html
Freemark, Y. (2005b, August 24). What is Moynihan Station? Retrieved May 11, 2016, from http://www.moynihanstation.org/newsite/2005/08/moynihan_station_animation.html
Givoni, M., & Banister, D. (2006). Airline and Railway Integration. *Transport Policy*, *13*(5), 386–397.
Global Insight. (2006). The Role of Metro Areas in the U.S. Economy.
Golden, A. (2014). Governance of Regional Transit Systems. Wilson Center.
Goldman, H., & Klopott, F. (2015, October 8). De Blasio Offers MTA $2.5 Billion in Bid to End Impasse. Retrieved April 27, 2016, from http://www.bloomberg.com/news/articles/2015-10-08/de-blasio-offers-mta-2-5-billion-in-bid-to-end-funding-impasse
Grynbaum, M. M., & Kaplan, T. (2015, June 24). Cuomo and de Blasio's Feud Is a Factor in an Anemic Legislative Session. *The New York Times*. Retrieved from http://www.nytimes.com/2015/06/25/nyregion/cuomo-and-de-blasios-feud-is-a-factor-in-an-anemic-legislative-session.html
Guo, Z. (2006, February). *Assessing the Transfer Penalty from Commuter Rail to Subway in Downtown Boston*. Presented at the 2nd Transportation Student Research Symposium.
Guo, Z., & Wilson, N. H. M. (2011). Assessing the cost of transfer inconvenience in public transport systems : A case study of the London Underground. *Transportation Research Part A*, *45*(2), 91–104. http://doi.org/10.1016/j.tra.2010.11.002

Hadas, Y., & Ranjitkar, P. (2012). Modeling public-transit connectivity with spatial quality-of-transfer measurements. *Journal of Transport Geography*, *22*, 137–147. http://doi.org/10.1016/j.jtrangeo.2011.12.003

Hall, P., & Pain, K. (2006). *The Polycentric Metropolis*. London: Earthscan.

Hamilton, D. K., Miller, D. Y., & Paytas, J. (2004). Exploring the Horizontal and Vertical Dimensions of the Governing of Metropolitan Regions. *Urban Affairs Review*, *40*(2), 147–182. http://doi.org/10.1177/1078087404268077

Harshbarger, R. (2014, April 1). West Side of Manhattan unready for commuter boom. Retrieved from http://nypost.com/2014/04/01/west-side-of-manhattan-unready-for-commuter-boom/

Harshbarger, R., & Teirstein, Z. (2015, December 2). Group proposes "Freedom Ticket" to alleviate long, crowded commutes. Retrieved May 11, 2016, from http://www.amny.com/transit/freedom-ticket-could-slash-many-hours-from-subway-and-bus-riders-commutes-fight-overcrowding-advocates-say-1.11185660

Heclo, H. (1978). Issue Networks and the Executive Establishment: Government Growth in an Age of Improvement. In A. King (Ed.), *The New American Political System*. Washington, DC: American Enterprise Institute.

Higgs, L. (2015, November 12). Feds agree to fund half of new Hudson rail tunnels, Booker says. Retrieved May 10, 2016, from http://www.nj.com/traffic/index.ssf/2015/11/booker_brokers_deal_on_entity_to_oversee_gateway_t.html

Higham, S. J. (1985, July 21). FIX-UP LAGGING AT PENN STATION. *The New York Times*. Retrieved from http://www.nytimes.com/1985/07/21/nyregion/fix-up-lagging-at-penn-station.html

Hill, E., Wolman, H., & Ford, C. C. (1995). Can suburbs survive without their central cities? Examining the suburban dependence hypothesis. *Urban Affairs Review*, *31*, 147–74.

Hirota, R. (1984). *Present Situation and Effects of the Shinkansen*. Presented at the International Seminar on High-Speed Trains.

Hooghe, L., & Marks, G. (2003). Unraveling the Central State, but How? Types of Multi-Level Governance. *The American Political Science Review*, (2), 233.

Howlett, M., Mukherjee, I., & Koppenjan, J. (2015). Policy Learning and Policy Networks in Theory and Practice: The Case of Indonesian Biodiesel Policy Network. Presented at the ICPP Conference, Milan, Italy.

Hsu, S. C. (2010). Determinants of passenger transfer waiting time at multi-modal connecting stations. *Transportation Research Part E*, *46*, 404–413.

Hudson Yards. (2016). The Master Plan - 17 Million Square Foot Mixed Use Development | Hudson Yards. Retrieved May 11, 2016, from http://www.hudsonyardsnewyork.com/the-story

Hughes, C. J. (2016, January 26). Daniel Doctoroff Takes His Business to Hudson Yards. *The New York Times*. Retrieved from http://www.nytimes.com/2016/01/27/realestate/commercial/daniel-doctoroff-takes-his-business-to-hudson-yards.html

IHS Global Insight (USA). (2013). *U.S. Metro Economies: Outlook - Gross Metropolitan Product, with Metro Employment Projections*. The United States Conference of Mayors. Retrieved from http://www.usmayors.org/metroeconomies/2013/201311-report.pdf

Iseki, H., & Taylor, B. D. (2010). Style versus Service? An Analysis of User Perceptions of Transit Stops and Stations. *Journal of Public Transportation*, *13*(3), 23–49.

Janic, M. (2001). *Air transport systems analysis and modeling*. Amsterdam, the Netherlands: Gordon & Breach Science Publishers.

Jonnes, J. (2008). *Conquering Gotham: Building Penn Station and Its Tunnels* (Reprint edition). New York, N.Y.: Penguin Books.

Kabak, B. (2015, July 30). 1968-2015: Requiem for the MTA. Retrieved from http://secondavenuesagas.com/2015/07/30/1968-2015-requiem-for-the-mta/
Katz, B., Puentes, R., & Bernstein, S. (Eds.). (2005). Getting Transportation Right for Metropolitan America. In *Taking the High Road: A Metropolitan Agenda for Transportation Reform* (pp. 15–42). Brookings Institution Press. Retrieved from http://www.jstor.org/stable/10.7864/j.ctt127xpp
Kelly, J. (2001, June 5). Amtrak's beginnings | Classic Trains Magazine. Retrieved May 11, 2016, from http://ctr.trains.com/railroad-reference/operations/2001/06/amtraks-beginnings
Kim, J. H., & Hewings, G. J. D. (2013). Interjurisdictional Competition and Land Development: A Micro-Level Analysis. In F. Pagliara, M. de Bok, D. Simmonds, & A. Wilson (Eds.), *Employment Location in Cities and Regions* (pp. 181–199). Springer Berlin Heidelberg. Retrieved from http://link.springer.com/chapter/10.1007/978-3-642-31779-8_9
Kim, J. H., Keane, T. D., & Bernard, E. A. (2015). Fragmented local governance and water resource management outcomes. *Journal of Environmental Management*, *150*, 378–386. http://doi.org/10.1016/j.jenvman.2014.12.002
Kimmelman, M. (2012, February 8). A Proposal for Penn Station and Madison Square Garden. *The New York Times*. Retrieved from http://www.nytimes.com/2012/02/12/arts/design/a-proposal-for-penn-station-and-madison-square-garden.html
Koch, M., & Newmark, G. L. (2016). Legislating Transit Co-opetition: Privatization and Planning Devolution in Germany. Presented at the 2016 Annual Meeting of the Transportation Research Board, Washington, DC: Transportation Research Record.
Lefèvre, C. (1998). Metropolitan government and governance in western countries: a critical review. *International Journal of Urban and Regional Research*, *22*(1), 9–25. http://doi.org/10.1111/1468-2427.00120
Legacy, C., Curtis, C., & Sturup, S. (2012). Is there a good governance model for the delivery of contemporary transport policy and practice? An examination of Melbourne and Perth. *Transport Policy*, *19*(1), 8–16. http://doi.org/10.1016/j.tranpol.2011.07.004
Lentz, J. (2016, January 14). State to fund MTA capital plan, but find the funding later. Retrieved April 27, 2016, from http://cityandstateny.com/articles/politics/new-york-state-articles/state-to-fund-mta-capital-plan,-but-find-the-funding-later.html#.VyEIYaODGko
Levinson, D. M. (2012). Accessibility impacts of high-speed rail. *Journal of Transport Geography*, *22*, 288–291. http://doi.org/10.1016/j.jtrangeo.2012.01.029
Levy, A. (2009, July 16). Regional Rail for New York City - Part I. Retrieved from http://www.thetransportpolitic.com/2009/07/16/regional-rail-for-new-york-city-part-i/
Loukaitou-Sideris, A., Taylor, B. D., & Turley, C. (2015). *Passenger Flows in Underground Railway Stations and Platforms* (Final Report No. MTA 12-43). Mineta Tansportation Institute. Retrieved from http://www.worldtransitresearch.info/research/5657/
Lowery, D., & Lyons, W. (1989). The Impact of Jurisdictional Boundaries: An Individual-Level Test of the Tiebout Model. *Journal of Politics*, *51*, 73–97.
Marks, G. (1993). Structural Policy and Multilevel Governance in the EC. In A. W. Cafruny & G. G. Rosenthal (Eds.), *The State of the European Community, Vol 2: The Maastricht Debates and Beyond* (pp. 391–410). Boulder, Colorado: Harlow Longman.
MAS. (2016). About MAS – The Municipal Art Society of New York. Retrieved from http://www.mas.org/aboutmas/#mission
Mckinley, J. (2016, April 18). Cuomo and de Blasio Campaign Hard for Hillary Clinton Despite Complex Ties. *The New York Times*. Retrieved from http://www.nytimes.com/2016/04/19/nyregion/cuomo-and-de-blasio-campaign-hard-for-hillary-clinton-despite-complex-ties.html
Melo, P. C., Graham, D. J., & Noland, R. B. (2010). Impact of Transport Infrastructure on Firm Formation Evidence from Portuguese Municipalities. *Transportation Research Record:*

Journal of the Transportation Research Board, (2163), 133–143. http://doi.org/10.3141/2163-15
Messick, P. (2015, March). *The Gateway Program: Critical Capacity for the Northeast Corridor*. Presented at the Presentation to Manhattan Community Board 4.
Meyer, M. D., Campbell, S., Leach, D., & Coogan, M. (2005). Collaboration: The key to success in transportation. *Transportation Research Record: Journal of the Transportation Research Board*, *1924*(1), 153–162.
Mishra, S., Welch, T. F., & Jha, M. K. (2012). Performance indicators for public transit connectivity in multi-modal transportation networks. *Transportation Research Part A*, *46*(7), 1066–1085. http://doi.org/10.1016/j.tra.2012.04.006
MTA. (n.d.-a). *Metropolitan Transportation Authority Description and Board Structure Covering Fiscal Year 2009* (MTA 2010 Annual Report). Retrieved from http://web.mta.info/mta/compliance/pdf/Description%20and%20Board%20Structure.pdf
MTA. (n.d.-b). Train to the Game – Football. Retrieved May 10, 2016, from http://web.mta.info/mnr/html/meadowlands/footballtrain.php
Murakami, J., & Cervero, R. (2010). California high-speed rail and economic development: Station-area market profiles and public policy responses. In *symposium, University of California, Berkeley Faculty Club*. Retrieved from http://www.its.berkeley.edu/sites/default/files/volvocenter/Cervero/California_High_Speed_Rail_and_Economic_Development_Paper_-murakami_cervero2.pdf
Nakagawa, D., & Hatoko, M. (2007). Reevaluation of Japanese High-Speed Rail Construction: Recent Situation of the North Corridor Shinkansen and Its Way to Completion. *World Transit Research*. Retrieved from http://www.worldtransitresearch.info/research/1449
Nelson, A., Sanchez, T., Wolf, J., & Farquhar, M. (2004). METROPOLITAN PLANNING ORGANIZATION VOTING STRUCTURE AND TRANSIT INVESTMENT BIAS: PRELIMINARY ANALYSIS WITH SOCIAL EQUITY IMPLICATIONS. *Transportation Research Record*, *1895*, 1–7.
New Jersey Transit. (2016). Retrieved February 24, 2016, from http://www.njtransit.com/tm/tm_servlet.srv?hdnPageAction=CorpInfoTo
New Jersey Transportation Trust Fund Authority - Overview. (2016, January 11). Retrieved February 24, 2016, from http://www.state.nj.us/ttfa/
New York State. (2016, January 6). 6th Proposal of Governor Cuomo's 2016 Agenda: Transform Penn Station and Farley Post Office Building Into a World-Class Transportation Hub. Retrieved May 11, 2016, from https://www.governor.ny.gov/news/6th-proposal-governor-cuomos-2016-agenda-transform-penn-station-and-farley-post-office-building
New York Times. (1963, October 30). Farewell to Penn Station. *The New York Times*. Retrieved from http://query.nytimes.com/gst/abstract.html?res=9407EFD8113DE63BBC4850DFB6678388679EDE
NJDOT Mission Statement. (2014, January 24). Retrieved February 24, 2016, from http://www.state.nj.us/transportation/about/mission.shtm
NJTRANSIT, & NJDOT. (2015). *New Jersey State Rail Plan*. NJTRANSIT. Retrieved from http://www.njtransit.com/pdf/NJStateRailPlan.pdf
Northeast Corridor Commission. (2014). *The Northeast Corridor and the American Economy*. Retrieved from http://www.nec-commission.com/wp-content/uploads/2014/02/NEC_american_economy_report.pdf
NYMTC. (2014). *Explanding Horizons: Planning Partnerships in the NY-NJ-CT Region*. New York Metropolitan Transportation Council. Retrieved from https://www.nymtc.org/mainpage/2014_Annual_report/Final_Areport2014_web.pdf
Orfield, M. (1997). *Metropolitics: A Regional Agenda for Community and Stability*. Washington, DC: Brookings Institution Press. Retrieved from

https://www.questia.com/library/2184733/metropolitics-a-regional-agenda-for-community-and
Ostrom, E. (2011). Background on the institutional analysis and development framework. *Policy Studies Journal*, *39*(1), 7–27.
Ostrom, V., Bish, R., & Ostrom, E. (1988). *Local Government in the United States*. ICS Press.
Ostrom, V., Tiebout, C. M., & Warren, R. (1961). The Organization of Government in Metropolitan Areas: A Theoretical Inquiry. *The American Political Science Review*, *55*(4).
Otúzar, J. de D., & Willumsen, L. G. (1995). *Modelling Transport* (Vol. 3). John Wiley & Sons.
Paaswell, R. E. (2009). Railway Development: Impacts on Urban Dynamics, edited by Frank Bruinsma, Eric Pels, Hugo Priemus, Piet Rietveld, and Bert van Wee. *Journal of Regional Science*, *49*(2), 387–390. http://doi.org/10.1111/j.1467-9787.2009.00610_7.x
PANYNJ. (2015, December). *Gateway Tunnel Project - Update*. Retrieved from https://www.panynj.gov/corporate-information/pdf/12-10-15-Board-Gateway-Project.pdf
Penn Station Planning Studio. (2013). *Reimagining Penn Station*. Philadelphia: University of Pennsylvania. Retrieved from https://issuu.com/pennplanning/docs/reimagining_penn_station_web
Peters, B. G. (1998). Managing horizontal government: the politics of co-ordination. *Public Administration*, *76*, 295–311.
Port Authority of New York and New Jersey. (2015). *Port Authority Board Advances Efforts to Build Critical Trans-Hudson Passenger Rail Tunnel Project*. Retrieved from https://www.panynj.gov/press-room/press-item.cfm?headLine_id=2341
Port Authority of New York and New Jersey. (2016). Overview of Facilities and Services - About the Port Authority - The Port Authority of NY & NJ. Retrieved March 2, 2016, from http://www.panynj.gov/about/facilities-services.html
Previdi, B. (2013, March 31). A different track for Penn Station. Retrieved May 1, 2015, from http://www.crainsnewyork.com/article/20130331/OPINION/303319981/bob-previdi-a-different-track-for-penn-station
Pucher, J., & Kurth, S. (1996). Verkehrsverbund: the success of regional public transport in Germany, Austria and Switzerland. *Transport Policy*, *2*(4), 279–291.
Railway Technology. (2016). Shinjuku Railway Station, Tokyo. Retrieved May 11, 2016, from http://www.railway-technology.com/projects/shinjuku-railway/
Rantala, S. (2012). Knowledge and brokerage in REDD+ policy making: A Policy networks analysis of the case of Tanzania. *Center for International Forestry Research*. Retrieved from http://www.cifor.org/library/3943/knowledge-and-brokerage-in-redd-policy-making-a-policy-networks-analysis-of-the-case-of-tanzania/
Real Transit. (2013). *Trends & Opportunities*. Retrieved from http://www.realtransit.org/trendsandopportunities2013.pdf
Regional Plan Association. (2014). *Fragile Success: Taking Stock of the New York Metropolitan Region*. New York City: Regional Plan Association. Retrieved from http://fragile-success.rpa.org/
Rhodes, R. A. W. (2008). Policy Network Analysis. In R. E. Goodin, M. Moran, & M. Rein (Eds.), *The Oxford Handbook of Public Policy*.
Rinde, M. (2015, August 13). Strength in Numbers: Can Transportation Alliance Get Gateway Project Going? - NJ Spotlight. Retrieved April 27, 2016, from http://www.njspotlight.com/stories/15/08/12/strength-in-numbers-can-alliance-of-transportation-entities-get-gateway-project-going/
Rivoli, D. (2015, November 15). MTA official wants to cut commute fares on LIRR, Metro-North. Retrieved May 11, 2016, from http://www.nydailynews.com/new-york/mta-official-cut-commute-fares-lirr-metro-north-article-1.2435966

Roberts, S. (2013, January 29). Grand Central's Flesh-and-Blood Landlord. *City Room*. Retrieved from http://cityroom.blogs.nytimes.com/2013/01/29/grand-centrals-flesh-and-blood-landlord/
Rosen, J. (2012, March). *MTA Real Estate: Creating Value for the MTA and its Stakeholders*. Presented at the Strategies for Repurposing Government Property. Retrieved from https://netforum.uli.org/iWeb/upload/ppt1235.pdf
Royer, C. (1992). Issues Facing Urban America. In *TRB Special Report* (Vol. 237, p. 88). Charlotte, NC.
RPM Systems Corporation. (2011). TriVenture Railroad Portfolio. Retrieved May 3, 2016, from http://www.rpmteam.com/page13.html
Rubinstein, D. (2015, August). Cuomo on paying for Amtrak tunnel fix: No. Retrieved April 27, 2016, from http://www.capitalnewyork.com/article/albany/2015/08/8573882/cuomo-paying-amtrak-tunnel-fix-no
Rusk, D. (1995). *Cities without Suburbs* (2nd ed.). Washington, DC: Woodrow Wilson Center.
Sandford, M. (2015). *Research Briefings - The Greater London Authority*. House of Commons Library, Parliament. Retrieved from http://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN05817
Sands, B. D. (1993). *The Development Effects of High-Speed Rail Stations and the Implications for California* (California High Speed Rail Series). Berkeley: Institute of Urban and Regional Development, University of California at Berkeley. Retrieved from http://www.uctc.net/research/papers/115.pdf
Schneider, M. (1989). *The Competitive City: The Political Economy of Suburbia*. University of Pittsburgh Press. Retrieved from https://books.google.com/books/about/The_Competitive_City.html?id=vkhYSPnCe58C
Schneider, M., & Stolz, J. (2003). Building consensual institutions: Networks and the national estuary program. *American Journal of Political Science*, *47*(1), 143–158.
Schulz, C. (2014, October 2). New Engineering Report Details Needed Work to Fix Amtrak N.Y. Tunnels. *Amtrak News Release*. Retrieved from https://www.amtrak.com/ccurl/110/167/Amtrak-NY-Tunnels-Report-ATK-14-089.pdf
Sciara, G. C. (2012, May). *MPO Critique*. U.C. Davis.
Sciara, G.-C., & Wachs, M. (2007). Metropolitan Transportation Funding: Prospects, Progress, and Practical Considerations. *Public Works Management & Policy*, *12*(1), 378–394. http://doi.org/10.1177/1087724X07303987
Seward. Amendment to Transportation Network Company Insurance Law, Pub. L. No. 4108 (2015).
Shechtman, P., Giuffra, R. J., Gossel, H., & Sherwood, O. P. New York State Ethics Commission Advisory Opinion No. 98-18 (New York State Joint Commission on Public Ethics November 23, 1998). Retrieved from http://www.jcope.ny.gov/advice/ethc/98-18.htm
Solof, M. (1998). *History of Metropolitan Planning Organizations*. Newark, NJ: North Jersey Transportation Planning Authority. Retrieved from http://www.njtpa.org/getmedia/b95661af-dfd4-4e3d-bb87-39e617619c7b/MPOhistory1998.pdf.aspx
Spink, P., Ward, P., & Wilson, R. (Eds.). (2012). *Metropolitan Governance in the Federalist Americas*. Notre Dame: University of Notre Dame Press.
SPUR. (2015, April). Seamless Transit: How to make Bay Area public transit function like one rational, easy-to-use system.
Star-Ledger Editorial Board. (2016, April 18). Solutions for N.J. transportation crisis? Don't wake the governor | Editorial. Retrieved April 27, 2016, from http://www.nj.com/opinion/index.ssf/2016/04/solutions_for_transportation_crisis_dont_wake_the.html

Stein, N. E. G. (2013). Spatial dimensions of high-speed rail: intermediate cities, inter-jurisdictional planning, and the implications for high-speed rail in Portugal. Massachusetts Institute of Technology. Retrieved from http://18.7.29.232/handle/1721.1/82723

Sweeney, M. (2016, February 15). The new transportation bill allows New York to get going. Retrieved February 24, 2016, from http://www.crainsnewyork.com/article/20160215/OPINION/160219983/the-new-transportation-bill-allows-new-york-to-get-going

Tangel, A. (2016a, March 2). NJ Transit Preps for a Strike. *Wall Street Journal*. Retrieved from http://www.wsj.com/articles/nj-transit-preps-for-a-strike-1456894842

Tangel, A. (2016b, April 20). MTA Approves $27 Billion Capital-Spending Plan. *Wall Street Journal*. Retrieved from http://www.wsj.com/articles/mta-approves-27-billion-capital-spending-plan-1461185953

Tangel, A. (2016c, April 24). Cuomo's Involvement Makes for Tense Times at MTA. *Wall Street Journal*. Retrieved from http://www.wsj.com/articles/cuomos-involvement-makes-for-tense-times-at-mta-1461516873

Tangel, A., Haddon, H., & Dawsey, J. (2014, December 28). New York, New Jersey Governors Veto Port Authority Changes. *Wall Street Journal*. Retrieved from http://www.wsj.com/articles/new-york-new-jersey-governors-to-veto-port-authority-changes-1419722744

TfL. (2003). *Annual Report 2002/03*. Transport for London. Retrieved from http://content.tfl.gov.uk/annrep-02-03.pdf

Tiebout, C. (1956). A Pure Theory of Local Expenditures. *Journal of Political Economy*, *64*(4), 416–424.

Tomer, A., Kneebone, E., Puentes, R., & Berube, A. (2011, May 12). Missed Opportunity: Transit and Jobs in Metro America. Retrieved May 11, 2016, from http://www.brookings.edu/research/reports/2011/05/12-jobs-and-transit

Topham, G. (2015, May 29). Clean, reliable and integrated: all change for neglected rail services in London. *The Guardian*. Retrieved from http://www.theguardian.com/uk-news/2015/may/29/neglected-rail-services-london-tfl-overground

Topham, G. (2016, January 21). Government backs TfL plan to run London's commuter rail services. *The Guardian*. Retrieved from http://www.theguardian.com/uk-news/2016/jan/21/tfl-londons-commuter-rail-services-department-for-transport

Transportation Capital Program FY 2016. (2015, July 31). Retrieved February 24, 2016, from http://www.state.nj.us/transportation/capital/tcp16/

Two NJ Transit rail unions reject contract that avoided strike. (2016, May 3). Retrieved May 10, 2016, from http://www.progressiverailroading.com/labor/news/Two-NJ-Transit-rail-unions-reject-contract-that-avoided-strike--48135

USDOT. (2011). *Pre-application for HSIPR Passenger Rail Program* (No. OMB No. 2130-0584). Retrieved from http://www.wikicountability.org/w/images/5/5b/March_11_individual_fd_construction_Part11.pdf

USDOT. (2015, September 28). About Us [Text]. Retrieved May 11, 2016, from https://www.transportation.gov/mission/about-us

USDOT. (2016, April 22). Fixing America's Surface Transportation Act or the FAST Act - FHWA | Federal Highway Administration. Retrieved April 26, 2016, from https://www.fhwa.dot.gov/fastact/

U.S. Global Change Research Program. (2000). Metropolitan East Coast Assessment. Retrieved from http://metroeast_climate.ciesin.columbia.edu/

Van Langenhove, L. (2013). What is a region? Towards a statehood theory of regions. *Contemporary Politics*, *19*(4), 474–490.

Van Nes, R. (2002). Design of multimodal transport networks: A hierarchical approach. Delft: Delft University Press.
Veeneman, W., Augustin, K., Enoch, M., Faivre d'Arcier, B., Malpezzi, S., & Wijmenga, N. (2015). Austerity in public transport in Europe: The influence of governance. *Research in Transportation Economics*. http://doi.org/10.1016/j.retrec.2015.07.005
Vranich, J. (1997). *Replacing Amtrak: A Blueprint for Sustainable Passenger Rail Service*. Retrieved from http://cagw.org/sites/default/files/users/user1/haswellAmtrakquote.pdf
Wardman, M., & Hine, J. (2000). Costs of Interchange: A Review of the Literature. Retrieved from http://eprints.whiterose.ac.uk/2075
Weir, M., Rongerude, J., & Ansell, C. K. (2008). Collaboration Is Not Enough: Virtuous Cycles of Reform in Transportation Policy. *Urban Affairs Review*, *44*(4), 455–489. http://doi.org/10.1177/1078087408322590
Whitford, E. (2015, November 12). Councilmembers Want MTA to Cut LIRR & Metro-North Fares to $2.75 Within City Limits. Retrieved May 11, 2016, from http://gothamist.com/2015/11/12/lirr_metro_north_nyc.php
Wilson, N., & Ferreira, J. (2006). *Improving the Understanding of Transfer Behavior in Urban Public Transport Networks (Phase II)* (No. MITR18-3). New England University Transportation Center.
Witbreuk, M. J. G. (2000). Regional transport networks and institution building : the role of co-operation. Retrieved from http://repository.up.ac.za/handle/2263/8341
World Bank. (2011). Metropolitan Transportation Institutions; Six Case Studies Australia, Brazil, Canada, France, Germany and the United States (A South Asia Transport Working Paper). World Bank.
Worrell, C. (2016, January 27). MTA approves final contract for East Side Access project. Retrieved May 10, 2016, from http://www.railwayage.com/index.php/passenger/commuter-regional/mta-approves-final-contract-for-east-side-access-project.html
Xu, R., & Obichere, C. (2016). Report on the Fiscal 2017 Preliminary Budget and the Fiscal 2016 Preliminary Mayor's Management Report: Metropolitan Transportation Authority. The Council of the City of New York. Retrieved from http://council.nyc.gov/html/budget/2017/pre/MTA.pdf
Zernike, K. (2014, December 5). Christie Worried About Bridge Scandal, Report Finds. *The New York Times*. Retrieved from http://www.nytimes.com/2014/12/06/nyregion/christie-worried-about-bridge-scandal-report-finds.html
Zernike, K. (2015, March 16). New Jersey Senate Upholds Christie's Veto of Port Authority Curbs. *The New York Times*. Retrieved from http://www.nytimes.com/2015/03/17/nyregion/new-jersey-senate-upholds-christies-veto-of-port-authority-curbs.html
Zhang, M., Zomer, G., & Tavasszy, L. (2009). *AET PAPERS - Dealing with Fragmentation in the European Cross-border Rail Freight Transport - a New Governance Approach*. Association for European Transport. Retrieved from http://abstracts.aetransport.org/paper/index/id/3155/confid/15