Why Transportation Mega-Projects (Often) Fail?

Case Studies of Selected Transportation Mega-Projects in the New York City Metropolitan Area

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These professionals share a common goal: to improve the delivery of essential transportation services to the public. They also share a common frustration - the difficulty of implementing transportation mega-projects in the New York metropolitan area. These are the projects which have the potential of providing significant public benefits in terms of access, mobility, preservation of jobs, economic development, sustainability and the quality of life.

This thesis attempts to tell the stories of the many dedicated transportation professionals, both in the public and private sectors, who work tirelessly on behalf of the public and whose voices deserve to be heard. Hopefully, this thesis will shed some light on the challenges faced by transportation professionals in implementing mega-projects and lead to further studies and, perhaps, institutional changes aimed at removing some of the major barriers to successful implementation of transportation mega-projects.

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ABSTRACT

Why Transportation Mega-Projects (Often) Fail?

This thesis explores the reasons why so few transportation mega-projects have been successfully implemented for nearly half a century in the New York City metropolitan area. Case studies of several major transportation projects are presented and analyzed. Interviews with project managers and other transportation professionals responsible for implementing mega-projects provided insight into some of the challenges faced by practitioners. This thesis suggests changes in project delivery methods and funding mechanisms that may help improve implementation of large, complex transportation projects that have a potential of providing significant public benefits. But, ultimately, fundamental institutional changes may be needed in order to effect meaningful improvements in mega-project delivery success rates and the type of mega-projects implemented. A key underlying planning/political economy issue is how to support the economic vitality of central cities in the face of an aging transportation system infrastructure and increasing competition for scarce funding resources while providing adequate protection of civil society and the environment.

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Chapter 1 - Introduction

The subject of this thesis relates to the implementation of large-scale transportation projects, commonly called "mega-projects", in the New York City metropolitan area. The Federal Highway Administration (FHWA) defines a mega-project as a large, complex transportation project having a construction cost of $1 billion or higher.[1] Typically, transportation mega-projects involve the replacement or construction of new transportation infrastructure, including large bridges, tunnels, highways, subways, commuter rail, rail freight, transit terminals, inter-modal facilities, airports, marine terminals, ports, pipelines, etc. Many mega-projects expand the capacity of the transportation system or provide new access, but infrastructure renewal is becoming increasingly more common as the transportation system is showing its age. Mega-projects whose primary focus is infrastructure renewal (replacement of aging and functionally obsolete facilities) generally also provide operational, safety, and some capacity improvements, where feasible, in order to maximize the value of the large public investment.

During the past four decades following the Robert Moses era, major new highway and transit construction has come to a virtual halt, except for basic infrastructure renewal and modernization. The transportation system has remained unchanged for decades with inadequate capacity to handle current and future traffic volumes. Attempts to implement highway mega-projects such as the Nassau Expressway, Westway, the Gowanus Expressway, Cross-Bronx Expressway, and Tappan Zee Bridge replacement have been abandoned entirely or delayed for decades. Transit system expansion plans, originally developed in the 1960's, were halted during construction in the 1970's due to lack of funding. The four track 63rd Street tunnel underneath the East River lay dormant for nearly three decades because there were no monies to complete the Queens and Manhattan portions of the expansion plans.[2] The Second Avenue Subway construction halted in the 1970's was finally restarted in 2007 and construction on the Grand Central

[1] Public Roads, Vol. 68, No. 1, July/August 2004
[2] In 2001, NYCTA "F" line service was rerouted to the 63rd Street tunnel.

Terminal East Side Access was finally restarted in 2006 using dedicated federal 'New Start' funding after three decades of delay.

Because there has been little highway or transit capacity increase in nearly half a century, traffic congestion along the region's highways has continued to increase over the years (although there was a respite during the Great Recession years from 2008-2010.) According to a national survey conducted by INRIX, a private provider of real-time traffic data, the New York/New Jersey metropolitan area is almost tied with the Los Angeles-Santa Anna area as the worst congested metropolitan area in the U.S. [3] Three of the top ten worst congested corridors in the nation are located in New York City: Cross-Bronx Expressway/NE Thruway (I-95); Long Island Expressway (I-495); and Gowanus Expressway/BQE (I-278).[4] All three congested corridors are designated as 'trade corridors' by the New York State Department of Transportation (NYSDOT) in recognition of their economic importance to the region.

Congestion delays have a negative effect on the urban economy as well as the urban environment. It takes longer for commuters to get to work resulting in lost productive time. Increased trucking costs due to congestion delays are ultimately passed on to the consumer in the form of higher costs for commodities. Slower moving vehicles on congested roadways consume more fuel resulting in not only higher fuel costs but also higher emission of pollutants, including greenhouse gases. The quality of life suffers as well for both the frustrated driver as well as residents living adjacent to highways suffering from the 'spillover' effects of congested highways.

Ultimately, congestion increases the cost of doing business making the New York City metropolitan area economically less competitive than urban areas with less congestion while decreasing the quality of life for both motorists and community residents. Congestion is likely to grow worse over time, both in terms of the number of hours of congestion and the number of miles of congested roadways. A recent New York Metropolitan Transportation Council Congestion Study estimates current daily

[3] INRIX 2010National Congestion Report Card
[4] Ibid

vehicle hours of delays at 1.54 million for New York City and the five suburban counties of Nassau, Suffolk, Westchester, Rockland, and Putnam. This figure is expected to increase about 46 percent by year 2035 to 2.25 million daily vehicle-hours of delay. Assuming that the average value of time is about $15[5] per hour (in the New York City area) and using an annual factor of 300, the current annual economic loss is conservatively estimated at about $6.9 billion, not including higher fuel costs. By 2035, this is expected to grow to $10.1 billion per year. These large economic losses will translate to lower productivity and higher consumer prices.

This thesis will explore the primary reasons why mega-projects have not been successfully implemented, or significantly delayed, in the New York City metropolitan area during the past 45 years, since the end of the Robert Moses era, by examining the changes that occurred in the implementation authority of transportation agencies, changes in the power relationships among key actors, and issues related to funding mechanisms. An understanding of the institutional context and funding of mega-projects will facilitate the development of a set of tentative recommendations for moving forward beyond the current mega-project paralysis that threatens the economic vitality of urban areas.

This thesis presents case studies of five representative transportation mega-projects in the New York City metropolitan area, three highway projects and two transit projects, to illustrate some of the challenges in implementing mega-projects and why these projects succeeded or failed. The following mega-projects are reviewed: 1) Nassau Expressway Project, Queens and Nassau County; 2) Westway, Manhattan; 3) Kosciuszko Bridge Replacement, Brooklyn and Queens; 4) John F. Kennedy Airport AirTrain Project, Queens; and 5) Access to the Region's Core (ARC) Project, New York and New Jersey. These projects were selected in order to illustrate a range of issues related to mega-project failures. The AirTrain project was selected because it is one of only a few transportation mega-projects implemented successfully during the past 45 years. This project serves to highlight the best practices of

[5] Value of time is estimated at 50% of hourly wage. It is assumed that drivers' hourly wage is higher than average.

project implementation under the current institutional framework but also reveals the challenges faced by even the most benign mega-projects.

The discussion of the Nassau Expressway project is intended to be more in-depth than the other case studies presented because it has a long development history that pre-dated the existing implementation process in order to show the importance of historical events in relation to the prevailing institutional framework in the implementation outcome. The discussions of the other case studies are more focused on the major implementation issues encountered and how they affected the ultimate success or failure of the project.

The primary information sources used to conduct the project reviews include various project study reports such as project scoping reports, Environmental Impact Statements (EIS), the Record of Decision (ROD) documents, interviews with representatives of the project sponsor and others who were involved in or had knowledge of the implementation process, and news articles relevant to the selected projects. The author was directly involved in two of the mega-projects presented: the Nassau Expressway and the AirTrain projects. The experience gained on these two projects, and other projects as well, have helped to illuminate the enormous challenges of navigating a mega-project successfully from the conceptual stage to full implementation.

For purposes of this thesis, a successful mega-project is defined broadly in terms of whether the planning process produced an approved project to address transportation problems and needs identified in the study area and whether that project was built according to the plan that came out of that planning process, meaning within the established scope, schedule, and budget at the time the project was approved. Another important measure of success is whether a mega-project, once constructed, performs according to the expectations that formed the underlying basis for approval of the project, including impacts, benefits, traffic or ridership estimates, revenue estimates, operating and maintenance costs, and service life. To date, only one of the five selected mega-projects has been implemented successfully, the JFK AirTrain project, and that project has met or exceeded most of the post-construction measures of success identified

previously based on conversations with representatives of the project sponsor. The other four selected mega-projects have either failed completely or only partially satisfied the criteria of success set forth in this thesis.

The successful implementation of mega-projects (as well as smaller projects) is dependent on context as well as the characteristics of the proposed mega-project and it is the unique interaction between the context in which mega-projects are implemented and the specific characteristics of the proposed mega-project that is of utmost importance in determining the ultimate outcome. Mega-projects, because of their size and scope, represent a sizable "foreign" object in the social and economic fabric of society. The key question is whether that foreign mega-project object can be successfully integrated or will it be rejected? And what are the key determining factors? These are the essential questions that this thesis will attempt to address.

Chapter 2 – Literature Review

The relevant literature on transportation mega-projects fall into three general categories: Political-Economy Theory and Practice, Case Studies of Mega-projects, and Practical Guidelines for Implementing Mega-projects. Political-economy theory and principles are essential to an understanding of the current institutional framework, and its limitations, under which mega-projects are implemented. Major changes in Mega-Project implementation are not likely to occur unless the institutions governing the implementation of these types of projects are changed as well. The second category of literature, Case Studies, focuses on "successful" implementation of mega-projects. However, the record shows that there were only a few of these projects, they took decades to complete, and they experienced huge cost overruns (in real dollars) from inception to completion. It should be noted that several pieces of the literature in this group also attempt to place the mega-projects within a political economy framework. The third category of literature deals with practical methods to implement mega-projects more quickly and within budget – but within the framework of existing institutions. The availability of so much literature on how to improve the implementation of mega-projects is an indication that the present process is "broken". In general, these publications are only marginally helpful because they do not address the underlying institutional constraints.

The thesis author attempts to integrate his 'life experiences' as an engineer and planner working in the public and private sectors in order to supplement the available literature. In addition, interviews were conducted (as described in the Research Method section) with key individuals in both the public and private sectors who have managed mega-projects. The interviews focus on getting a better understanding of the problems encountered by transportation professionals in the implementation of mega-projects in the New York City metropolitan area.

Political – Economy Theory

Caro, Robert A., The Power Broker: Robert Moses and the Fall of New York,
Vintage Books Edition, September 1975

This is an important piece of literature on the subject of mega-projects under the "liberal" era that predated the 1969 National Environmental Policy Act (NEPA). This epic work details the life of Robert Moses and his long career as a master builder of bridges and highways (as well as a wide variety of other public infrastructure) in New York City, Long Island, and Westchester, spanning over four decades between the 1920's and the 1960's. Moses' mega-projects began during a period (pre-1950's) Altshuler and Luberoff refer to as being characterized by 'minimalist' government that "….almost never imposed significant disruption on existing built-up areas" (page 8). Federal highway aid to localities (administered by the Bureau of Public Roads) prior to the 1950's was meager and focused on rural roads, not urban highways. Altshuler and Luberoff argue that the era of highway mega-projects began after WWII, in the 1950's, when the federal government established the Highway Trust Fund, using gasoline taxes and other excise taxes to fund the Interstate Highway program in both rural and urban areas. Robert Moses's mega-projects, then, predated the "Great Mega-Project Era" described by Altshuler and Luberoff (page 13-21) by at least 20 years. In the New York City area, the era of mega-projects was about 40 years, from the 1920's to the 1960's – twice as long as the period presumed by Altshuler and Luberoff. In effect, there were two overlapping Mega-Project eras, the Moses era and the Interstate Highway era. The core enabling elements of both Mega-Project eras were Money and Power – with Power dominant during the early years of the Moses era and Money dominant during the Interstate Highway era when federal funds were readily available for urban highways. The key questions explored by Robert Caro's exhaustive and excellent work relate to the use (and abuse) of state Power to implement mega-projects. A close look at the mega-project era is important because the excesses during this period led to the curtailment of mega-projects.

Polany, Karl, The Great Transformation: The Political and Economic Origins of Our Time, Beacon Press, Boston, 2001

Published originally in 1944, this masterpiece by Polanyi is still very relevant. Polanyi argues that the "free-market" is a myth because it cannot be sustained as an entity separate from the state and society. When the "free-market" attempts to become separate, a reaction is triggered that causes the "free-market" to become re-embedded into society. Although Polanyi's work relates to private entities, his ideas have been liberally applied to public entities responsible for mega-project implementation because these entities operated in a similar manner. During the free-market "Great Mega-Project Era", the lack of market controls resulted in the devastation of neighborhoods and the destruction of the natural environment. It can be argued that the environmental movement and the "freeway protests" in the 1960's that led to the enactment of NEPA re-embedded the "free-market" into society. Polanyi describes a constant tension between "free-market" tendencies and forces that embed the market into society. He postulates that there is a continuum between liberal "free-market" and Marxist ideology which leaves open the possibility of a different equilibrium manifested by institutional reform. That equilibrium point may not be constant over time as values of society change. This thesis will explore whether there is a potential to change institutions rooted in a period of great distrust of the state and the market economy.

Goulet, Dennis, "Three Rationalities in Development Decision-Making", World Development, Vol. 14, No. 2, pp 301-317, 1986

Dennis Goulet theorizes about three rationalities governing planning and development decisions: political, technical, and ethical. He argues that actors often try to impose a unitary rationality on development plans leading to failure. As an example, the highway engineer may attempt to design the most cost-effective highway alignment (utilizing only the technical rationality) and fail to consider community (political) and environmental (ethical) rationalities. It should be understood that the rationalities do not operate independently of each other – but are inter-related, allowing some degree of substitution. For instance, an innovative technical solution may solve an air-pollution problem or

tunneling may avoid community impacts. However, in the latter case, the expense of tunneling may adversely affect the political rationality since the allocation of funds competes with other priorities.

Theory and Case Studies

Alan Altshuler and David Luberoff, Mega-Mega Projects: The Changing Politics of Urban Public Investment, The Brookings Institution, 2003

This is a rare and exceptional find in an otherwise sparse literary landscape. These important work places mega-projects within the context of three distinct historic and political periods: 1) the pre-1950 era, 2) the "Great Mega-Project Era" between the 1950's and 1960's, and 3) post 1970 to present. This work also provides detailed case studies of three mega-projects relating to highway expansion (reconstruction), airports, and mass transit. The highway Mega-Project case study is particularly relevant. It examines in detail the planning, development and implementation of the Central Artery/Tunnel (to Logan Airport) Project in downtown Boston. The Central Artery Project is notable not only because of its size and complexity, but because of the demonstrated ability of the state to recreate the political forces at all levels necessary to sustain momentum (and funding) over a very long period of time in order to implement this project. In many ways the characteristics of the Central Artery Project mirrors the Nassau Expressway Project – except it was built while the Nassau Expressway Project is still foundering. Both projects were originally conceived in the 1960's, involved construction in an urban setting with significant social and economic impacts, and required extensive environmental reviews and mitigation. A key question is: why was the Central Artery Project built while the Nassau Expressway Project withered? What was different?

Case Studies

Nassau Expressway Final Environmental Impact Statement – New York State Department of Transportation 1981

Nassau Expressway Operational and Safety Improvement – New York State Department of Transportation – Region 10 (Nassau and Suffolk), 2011

Southeast Queens Transportation Study – New York State Department of Transportation – Region 11 (New York City), 2011

These three technical reports document the planning efforts along the Nassau Expressway corridor over the past three decades. In addition to these documents, there were a number of re-evaluations in the 1980's and 1990's that led to the construction of pieces of the original Nassau Expressway plan, but in a modified form.

The first document, the 1981 EIS, was prepared about 10 years after the Nassau Expressway project was halted. This report details the need for the project and the full range of social, economic, and environmental impacts. The appendix provides details of the extensive public participation process and agency coordination during the EIS development process and provides an insight regarding the issues/conflicts that surrounded the project. The public record indicates that there were a number of conflicts that developed between the state and the community, but were successfully negotiated and resolved. The state showed considerable flexibility in trying to accommodate the needs of the community and to minimize impacts. Ultimately, a recommended alternative was chosen that was acceptable to the community as well as the permitting/approval agencies at all three levels of government. It is interesting to note that, except for the Boulevard option in Section E, the recommended alternative was similar to the original 1960 plan. Upon the successful completion of the EIS, there was an expectation that the Nassau Expressway would be finally built. However, due to funding constraints only a portion of the recommended plan was actually built: 1) the connection between the new JFK Expressway to John F. Kennedy International Airport and the Van Wyck Expressway was improved in Section B and 2) in the 1990's, the three mile Section E was built in Nassau County between Burnside Avenue and the Atlantic Beach Bridge. Section E was built as a divided 'boulevard' instead of an expressway in accordance with an agreement reached with the local community. The remaining seven miles of the Nassau Expressway (Sections A, B, C, and D) have not been completed due to a lack of funding. See Figure 5-1 showing the development history of the Nassau Expressway.

The second study, Nassau Expressway Operational and Safety Improvements, was initiated by NYSDOT in 2007 to identify transportation needs along the "Interim Nassau Expressway" between Burnside Avenue and Rockaway Turnpike. The study focused on a short 0.6 mile section of the Nassau Expressway and proposed pavement reconstruction and short-term operational and safety improvements. The study examined several long-term improvement ideas, but further development work was deferred, recognizing that these concepts need to be considered within a broader context that includes the entire Nassau Expressway corridor.

The third study covering the entire 7.1 mile Nassau Expressway corridor, between Cross Bay Boulevard in Queens and Burnside Avenue in Nassau County, was initiated in 2009 by NYSDOT Region 11 and completed in 2012. This latter study included the short section covered by the Region 10 study and focused on a full range of solutions that included early action, short-term, mid-term, and long-term projects. A key criteria in developing the alternatives was to ensure that they are consistent (or do not preclude) future options to complete the original 1981 Nassau Expressway Plan. Due to funding constraints, the study was refocused to short-term, low-cost operational and safety solutions that could be implemented within the state's capital program budget. Several promising mid-term and long-term projects were identified (at the conceptual level) but further development work has been deferred due to a lack of funding.

West Side Highway Project, Supplemental Final Environmental Impact Statement, Vol. 1, Vol. 2, and Vol. 3, FHWA and NYSDOT, 1984

Volume I – Non-Fisheries Portion, supplements the original Final Environmental Impact Statement approved in 1977. It updates the baseline social, economic, and environmental conditions and documents the changes to projected impacts of the Westway project.

Volume II – Fisheries Portion, is the main focus of the Supplemental Final Environmental Impact Statement in order to address questions raised by a lawsuit filed in the U.S. Federal Court Southern District of New York. The analysis of fisheries impacts (on striped bass populations) and the mitigation

plan in the FEIS were subsequently held by the court to be inadequate. This was the final blow to the Westway project since the deadline for trade-in of the Interstate monies would not allow time to redo the Supplemental FEIS.

Volume III – Comments and Responses documents the public comments and the agency responses to the comments. The public participation report depicts a contentious relationship between the project sponsor and community and environmental groups.

Kosciuszko Bridge Final Environmental Impact Statement and Record of Decision, NYSDOT 2008

The public participation record in the FEIS shows a cooperative relationship between the project sponsor and the community as well as with reviewing state and city agencies. The planning process went relatively smoothly, but it took 10 years to complete.

Access to the Region's Core (ARC) FEIS and Record of Decision, Federal Transit Administration and New Jersey Transit, 2008

The FEIS and Record of Decision portray a "successful" mega-project. But the FEIS and the project approval were flawed because the cost estimates were too low and the funding commitments were shaky at best. This project illustrates the dangers of implementing a mega-project with faulty assumptions. The long planning process, from 1995 to 2008, also contributed to project implementation failure because of the difficulty of maintaining political support for an extended period of time.

JFK Light Rail System (AirTrain) Final Environmental Impact Statement and Record of Decision, FAA and PANYNJ, 1997

After 21 failed attempts, the PANYNJ succeeds by learning from its past experience. The FEIS documents a good relationship between the community, outside agencies, and the project sponsor. The project attribute, with minimal impacts, and the project implementation method were key factors in successful implementation.

Improving Current Practices

"Integration and Streamlining Transportation Development and Decision-Making", Federal Highway Administration, 2003

After many years of promulgating new and increasingly more complex federal regulations, recent Federal Highway Administration (FHWA) publications focus on 'streamlining' the environmental review process. This publication recommends workshops/seminars, specialized area training programs, technical guidance "how to" manuals, development of document templates, and further research to determine the need for even more training programs. The focus is clearly to make the existing complicated project production process work better by improving the skills of practitioners. Mega-projects are in a class by themselves and are individually unique at the local level. No two mega-projects are alike. Therefore, it is unlikely that any generalized training or 'document template' will significantly improve upon the delivery of mega-projects.

University of Maryland/FHWA, "From Community Involvement to Final Product: Marketing Mega Projects and the Public Trust", May 3, 2004

This is a somewhat promising publication, but tends to oversimplify the project delivery process and relies too heavily on the element of trust as the primary vehicle for implementing mega-projects. The authors assert that creating and maintaining public trust is essential to the effective marketing of mega-projects. It adds that the marketed 'product', presumably the Mega-Project and its effects, must address the needs of the 'target market' but does not elaborate on how. The concept of marketing to the public implies an exchange of value that requires trust as an essential element of the transaction (or third party enforcement mechanisms). (Platteau, 1994) Some important questions arise. Who exactly is the public? What is being exchanged? And, to what extent public trust is shaped by prior experiences and ingrained perceptions. The 'marketing' approach to implementation of projects would seem to be applicable to the segment of the public deriving a benefit while the need for public 'trust' would seem to apply most to the public whose interests are potentially harmed (during and after construction). This segment of the public would need to feel confident that the state would make a maximum effort to avoid or minimize negative

impacts or address them in a fair and equitable manner if impacts cannot be avoided. This is where prior experience and perceptions of the state really matter.

Sinnette, Jim, "Building Trust", Public Roads Volume 68, No. 1 Jul/Aug 2004

This article focuses on "stewardship" as the new normative role of transportation practitioners as a means of building public trust in the planning, design, and implementation of highway mega-projects. In a quote, Administrator Mary E. Peters of the Federal Highway Administration defines stewardship as "…managing another person's property or investment, implying trust and confidence, accountability, efficiency, effectiveness, and quality." This is an important institutional paradigm shift adopted by State Transportation Agencies that is expected to lead to better project implementation outcomes. The emphasis is on communication, transparency, and accountability. The practical examples of stewardship for several mega-projects are helpful.

The author of this article, Jim Sinnette, is a highway engineer on the Major Projects Team in the FHWA Office of Program Administration. The establishment of such a team within FHWA is indicative of the special organizational emphasis afforded to mega-projects. The Port Authority of New York and New Jersey has a similar group called Office of Priority Projects. In the past, NYSDOT has assembled a dedicated Mega-Project staff (with a separate office) for the defunct Westway Project and the successor Route 9A Project along the Manhattan west side.

FHWA Office of Innovative Programs
http://www.fhwa.dot.gov/ipd/project_delivery/tools_programs/project_management_plans/guidance.htm [9/16/2011 2:16:50 AM]

As part of the "Safe, Accountable, Flexible, Efficient Transportation Equity Act" (SAFTEA) enacted in 2005, FHWA mandated State Transportation Agencies (STA's) to file a draft project management plan and a financial plan for FHWA and approval prior to the approval of the NEPA decision document for federally funded mega-projects with a cost of $500 million or more. A final project management plan and financial plan must be submitted within 90 days after the approval of the

NEPA decision document. Subsequent project management and financial plans must be submitted annually for review and approval. The project management plan and financial plan must include (among other requirements) the project goals and objectives, scope of work, project costs, project schedule, finance plan, organizational charts, roles and responsibilities, project activities and deliverables, and current project status. FHWA's intent is to closely monitor mega-projects from the Design Approval phase (NEPA document approval) through final design and construction. Most likely, the huge delays and cost overruns incurred by the Boston Central Artery project, and other projects, led to closer scrutiny and oversight of mega-projects by FHWA. It is unclear whether this close FHWA monitoring has achieved better project delivery outcomes.

Sorrel, Tom, "Life Cycle Continuum", Public Roads Volume 68, No. 1 Jul/Aug 2004
http://www.fhwa.dot.gov/publications/publicroads/04jul/04.cfm[9/16/2011 2:02:56 AM]

This publication suggests a more streamlined approach to implementing mega-projects. The author, Tom Sorrel, argues that the traditional project production process involving "stove-piping" where each phase of the project (planning, preliminary design and environmental review, final design and right-of-way-acquisition, construction, and operation/maintenance) is not efficient and does not lead to the optimum outcomes. The hand-off to different functional groups for each project phase ("stove-piping") introduces delays and a discontinuity in the development process that can lead to critical omissions and/or design errors. Sorel argues that mega-projects should be handled by an integrated multi-disciplinary team from "cradle to grave". He adds that the negative effects of "stove-piping" are exacerbated when applied to mega-projects because of their "…size, impacts, interests and involvements, and the complex financial requirements."

Sorel makes a cogent argument for not "stove-piping" major projects, especially mega-projects. Most State Transportation Agencies recognize the short-falls of "stove-piping" and organize dedicated multi-disciplinary project teams that report directly to executive level management. The main issue with

multi-disciplinary teams is that the required staffing is usually drawn from existing functional groups leaving the donor groups weakened and unable to deliver the ongoing capital program.

Summary

The literature on political-economy can explain, in theoretical terms, how the environmental movement and the "freeway revolts" led to the formation of new institutions (for instance the National Environmental Policy Act of 1969). These new institutions essentially transformed the conflict between civil society and the state to one that is now largely contained within the state. The institutionalization of conflict within the state was deliberate and designed to insulate civil society from previous abuses and excesses. The institutional changes were highly effective in curtailing the power of the state to implement mega-projects and it explains why there have been so few mega-projects nationally and, in particular, in the New York City metropolitan area. Political-economy theory also suggests that there is a possibility of institutional change to a new equilibrium, one that exhibits more balance between internal state conflict and state vs. civil society conflict.

The literature on case studies is informative and illustrates the difficulty of implementing under the current institutional framework. The mega-projects case studies indicate that these projects took decades to complete after endless and exhaustive studies. Huge cost overruns, typical of Mega-projects, are due to "low-balling" of initial estimates in order to secure funding and 'excessive' mitigation' costs incurred in the process of coopting the opposition.

The literature on "Improving Current Practices" of implementing Mega-projects provides helpful guidance, but is only marginally effective because the underlying institutional framework remains unchanged. The ubiquitous number of these types of "self-help" publications suggests that there is an awareness of a problem, but the solutions focus on the symptoms rather than the root causes.

In sum, the literature specifically relating to mega-projects is sparse, except for the "self-help" variety, and they are of limited usefulness in understanding the root cause of mega-project paralysis. The literature relating to political-economy helps to frame the problem and potential solutions in theoretical

terms, but more work is needed to transform theory into action. The case studies of mega-projects shed some light on the essential characteristics of mega-projects that were (eventually) implemented. These project characteristics are shaped (and constrained) by current state institutions that internalize conflicts.

Chapter 3 – Research Method

The research method consists of three parts: case studies, interviews with principal institutional actors, and transportation data research and analysis, where appropriate, in order to provide context.

Case Studies

Five transportation Mega-Projects were selected in the New York City metropolitan area for case study analysis. These projects represent a variety of modes and differ with respect to development history, project impacts, and the context in which project implementation activities occurred.

1) *The Nassau Expressway Project, Queens and Nassau County, N.Y.:* This $600-800 million project (in current dollars) was selected because of its long development history, endless planning studies, and little progress during the past 45 years. This 10-mile highway expansion project started prior to NEPA in the 1960's as part of the Interstate Highway Program. A three mile section in Queens was built, but only in the eastbound direction, when the project was stopped due to environmental concerns. Planning was restarted in 1973 under the NEPA process that led to an approved EIS in 1981. Reevaluations of the EIS in the late 1980's and early 1990 have resulted in the construction of a several discontinuous sections. But the Nassau Expressway remains uncompleted and a solution to the most severe congestion problems along the corridor remains elusive. The planning process was restarted again in 2009 by the New York State Department of Transportation (NYSDOT) with the initiation of the "Southeast Queens transportation Study". A Draft Project Scoping Report (PSR) was prepared in 2012. The research will analyze the implementation method, the institutional conflicts that shaped the development of the project, and the financial problems that delayed this project for over 40 years. The primary data sources will be the 1981 Final Environmental Impact Statement and the 2012 Southeast Queens Transportation Study, including the official public record of agency comments and public comments. As the consultant project manager and principal author of the latter study, I will add my personal experience and knowledge to the research.

2) *Westway Project, Manhattan, N.Y.:* This $2.1 billion highway expansion and redevelopment project started around the same time as the Nassau Expressway project, in the early 1970's, under the new NEPA process. But the implementation method, the project impacts, as well as the implementation context differed. After nearly 15 years of contentious planning, the funds were traded in for mass transit and a less ambitious at-grade boulevard replacement for the collapsed elevated West Side Highway was eventually constructed. The failure of this high profile mega-project was a symbol of the change in the balance of power brought about NEPA and it had a profound effect on NYSDOT's project selection criteria and the implementation strategy it used following the demise of Westway.

3) *The Kosciuszko Bridge over Newtown Creek, Brooklyn and Queens, N.Y.:* This $1.2 billion Mega-Project is basically a replacement of a 1.1 mile structure carrying the Brooklyn-Queens Expressway, an Interstate highway carrying over 160,000 vehicles a day. The existing structure is in poor condition and is functionally obsolete. The planning process took 10 years to determine that the Kosciuszko Bridge should be replaced, illustrating the difficult and time-consuming implementation process affecting large scale infrastructure renewal projects and our diminished ability to rebuild an aging transportation system.

4) *Access to the Region's Core (ARC), New Jersey and New York:* This $8.7[1] billion commuter rail expansion project would nearly double the existing train capacity into Penn Station N.Y with the construction of two new rail tunnels under the Hudson River and two new tracks along the Amtrak Northeast Corridor to allow direct access by New Jersey Transit trains into Manhattan. This project was selected because it illustrates a fatal technical failure that led to a loss in political support and funding for the project. The project also demonstrates a fierce competition for scarce funding resources at the state level and has implications for all mega-projects. The slow (and painful) planning process eventually resulted in an approved FEIS, but the delays led to the loss

[1] Cost is based on the published 2008 FEIS. By 2010, the cost estimate increased significantly to at least $11 billion, and possibly as high as $14 billion.

of political support at the start of construction with the election of a fiscally conservative governor in New Jersey who reversed previous funding commitments for the project.

5) *JFK AirTrain Project, Queens, N.Y.*: This $1.9 billion transit expansion project completed in 2004 improves intra-airport circulation within JFK International Airport and provides links to the Long Island Railroad station in Jamaica and the NYC Transit Authority subway station at Howard Beach. This project was selected because it is considered to be one of the few transportation mega-projects successfully implemented in the New York City metropolitan area since the enactment of NEPA in 1969 and after 21 failed attempts to improve airport access. A key question is why the previous attempts failed.

Several other mega-projects are reviewed briefly including the Goethals Bridge, the Tappan Zee Bridge, the Gowanus Expressway, the Second Avenue Subway, the #7 Line Subway Extension, and the Boston Central Artery/Tunnel Project. The intent of the case studies is to analyze a variety of mega-projects in order to find certain common characteristics of successful and unsuccessful projects. Ideally, it would be desirable to examine many more mega-projects to arrive at more definitive answers about why mega-projects (often) fail. However, the five mega-projects reviewed provide a reasonable starting point.

The analysis of the five selected mega-projects, as described above, relies upon published studies (primarily EIS's and Record of Decision documents), interviews with transportation professionals, and the author's own experiences in implementing mega-projects.

Interviews

A total of 10 interviews were conducted in February and March 2012 with senior transportation professionals, in both the public and private sectors, having direct knowledge relating to one or more of the case studies presented. Due to the need to maintain strict confidentiality, the names and organizations of interviewees will not be disclosed. The interview questionnaire is in the Appendix.

Interviewees were asked to describe their role specific to the mega-project they worked on and to describe the issues that emerged and how they were addressed. Specific questions were asked regarding changes in cost, schedule, and project scope. Participants were asked to suggest ideas about how they though the project implementation process can be improved. In some cases the interviews were open discussions relating to project implementation issues rather than the standard question and answer format. The observations made by the interviewees, in general, showed remarkable similarities. They all expressed a degree of frustration and a sense that the mega-project planning and implementation process needs a major "overhaul". There were a number of specific suggestions or observations made by one or more interviewees that are presented in this thesis without attribution in order to protect the source of the information and the organization they represent.

Transportation Data and Analysis

For the most part, this thesis relies on existing data sources published by the New York Metropolitan Transportation Council (NYMTC), Federal Highway Administration (FHWA), New York State Department of Transportation (NYSDOT), and other public agencies. The focus of the data research is to provide context for the thesis discussion relating to congestion and the economic impacts of congestion. The recent NYMTC study, "Congestion Management Process", April 2010, provides a comprehensive analysis of existing and future 2035 congestion levels along freeways, arterials, and local streets. The study utilizes two measures of performance: lane-miles of congested roadways and total vehicle hours of delay. In addition, the study provides the percentage of lane-miles congested and the projected change in congested lane-miles between 2010 and 2035 based upon projected traffic growth and the characteristics of a future build highway network. The study indicates that even with the 2035 Build Plan, congestion is expected to increase significantly by 2035. The total vehicle hours of delay is also expected to increase significantly by 2035. The recommended "improvements" focus on Transportation System Measures (TSM), but no major expansion of capacity. NYMTC's own analysis suggests that perhaps not enough is being done to address existing and future congestion.

INRIX, a private sector provider of real time travel data, has estimated congestion levels in the major metropolitan areas in the U.S. The New York Region (which includes portions of New Jersey) ranks a close second next to Los Angeles in terms of overall congestion levels. Three of the ten worst congested corridors in the nation are in New York City.

FHWA and USEPA data relating to national vehicle-miles traveled (vmt) trends and air quality trends indicate that since 1970, vmt has doubled while air pollution emissions from mobile sources has fallen over 80 percent. This data suggests that the EPA should continue to focus on the application of vehicle emissions standards and new technology to reduce mobile source emissions rather than at the project level. The current trend of hybrid and electric vehicles could reduce air pollution even further. The data suggest that perhaps it is time to rethink the need for detailed and time-consuming project level air quality analysis for highway and transit improvements. There may be other similar regulatory requirements that could be relaxed.

Chapter 4 - Background

Transportation mega-projects are implemented both within the context of state institutions that evolved from past historical events and also within the context of current political-economic forces at the federal and local levels that continually change the 'landscape' in which mega-projects are to be integrated into, if they are to be implemented successfully. An understanding of the context in which mega-projects are introduced, planned, approved, financed, designed, and finally constructed is critical to the successful outcome of the mega-project implementation process.

There are two relevant historical periods providing contrasting context for mega-project implementation. The first is the Robert Moses era which spanned about 40 years, ending in the late 1960's. This was a period characterized by few institutional constraints and prolific mega-project construction. The second period began with the 1969 National Environmental Policy Act (NEPA) and remains the primary institutional context for project implementation along with complementary state and local environmental laws and regulations enacted in the wake of NEPA. This second period is characterized by many institutional constraints and a dearth of successfully implemented mega-projects.

The Robert Moses Era

The period between the 1940's and 1960's, was the "Golden Age" of mega-projects nationally according to Altchuler and Luberoff (1978). This era was fueled by Interstate Highway and Defense Act of 1956. However, in New York, the "Golden Age" was much longer, spanning a 40 year period between the 1920's and 1960's under the leadership of Robert Moses. Moses built parks, parkways, bridges, tunnels, hospitals, prisons, and other public works projects throughout the state, but his impact was most felt in New York City, Long Island, and Westchester where his prolific mega-projects have profoundly altered the urban and suburban landscape (Caro 1974).

While Moses' critics focus on the 'ruthless' methods he used to implement his mega-projects and the resulting social costs - damage to the environment and dislocation of businesses and residents – his admirers point to the efficacy and beauty of his mega-projects and are awed at the lightning speed with which they were implemented. Moses was a 'one-man' show. He conceived, planned, and approved his mega-projects with little or no input from other governmental agencies or the general public. He used cunning and guile to disarm the opposition or destroy them entirely. He used the press effectively to squash political opposition and special interest groups by often framing the issue around the "rich and powerful vs. the poor and helpless". And Moses received crucial executive support from Governor Alfred E. Smith and other high elected officials who would share the credit for the accomplishments that they supported.

Moses had power but the key early challenge he faced is familiar – money! Moses fought constantly with the Legislature to appropriate the monies to fund his many mega-projects. The money would trickle in, but it would never be enough. Moses would deliberately understate the full cost of his mega-projects in order to secure the funding. When the mega-project was half constructed, he would go back for more money knowing that the Legislature would be too 'embarrassed' to stop a project in the middle and waste the public funds they had previously approved for the project.[1]

But then Moses came up with a brilliant idea to expand and consolidate his power. He built tolled bridges and tunnels crossing the East River, the Harlem River, the Verrazano-Narrows, and other waterways. Now he had a dedicated source of funds for his mega-projects completely under his control. No more groveling at the feet of the Legislature or even the Governor during the annual budget appropriations.

[1] The MTA apparently used the same strategy in the 1960's and early 1970's by building the Second Avenue subway line in discontinuous sections. The strategy backfired when the New York City fiscal crisis halted the MTA expansion program.

Now that Moses had absolute power, including a stable and secure source of funds, he built the roads connecting to the tolled facilities, thereby increasing the traffic and the revenue collected at these facilities. As Moses' money and power grew, so did his plans. And his ambitious plans were becoming increasingly disruptive to the environment and to the lives of ordinary (voting) citizens. The greatest casualty of the Robert Moses era, however, was the erosion of public trust.

Social Unrest and the Formation of New State Institutions

In the 1960's, in the backdrop of diminishing public trust of the state as a protector of the public welfare, environmental protests and "freeway revolts" broke out all over the country, including in New York. The protest movements were a likely extension of the ongoing protest movement against the Vietnam War in the 1960's. The social capital gained during WWII in the defense of the nation was being quickly eroded by a state that was increasingly viewed as being motivated by the interests of the liberal free-market system – the 'military industrial complex' that gave birth to the National Interstate and Defense Highway System. The schism between the free-market system and society created tensions between the state and civil society that ultimately threatened the power base of the political elite.

Polanyi (1944) argues that the "free-market" (and by inference the schism between the free market and society) is a myth because it cannot be sustained as an entity separate from the state and society. When the "free-market", as envisioned by Adam Smith and others, attempts to become separate and really free, a reaction is triggered that causes the "free-market" to become re-embedded into society. During the "free-market" Robert Moses era and the Interstate Highway era, the lack of market controls resulted in the devastation of neighborhoods and the destruction of the natural environment. It can be argued that the environmental movement and the "freeway protests" in the 1960's that led to the enactment of NEPA (and other environmental laws) re-embedded the "free-market" into society by the late 1960's and early 1970's.

The new state institutions and organizations created by NEPA and related environmental laws essentially transformed the conflict between civil society and the state to one that is now largely contained

within the state. The internalization of conflict within state institutions was not only designed to insulate civil society from previous abuses of the state and its free market compatriots but also to insulate elected officials from the wrath of the voting public.

Polanyi describes a constant tension between "free-market" tendencies and forces that embed the market into society. He postulates that there is a continuum between liberal "free-market" and Marxist ideology which leaves open the possibility of a different equilibrium manifested by institutional reform. That equilibrium point may not be constant over time as values and attitudes of society change. This would seem to leave open the possibility to change institutions rooted in a period of great distrust of the state and the market economy. A new social protest movement against chronic congestion may be a catalyst for institutional reform through the political process. However, it would seem that a new equilibrium could only be forged under conditions where public trust is restored sufficiently to allow some lessening of institutional conflicts within the state. In the absence of trust, there must be institutions in place that control behavior in a market economy (Platteau 1994). The conflicts within state institutions serve to place limits not only on the actions of private firms but on state actions as well.

The re-embedding of the free market into society was very deep, ushering in a new and long lasting era described by Altshuler and Luberoff (2001) as the 'do no harm era'. Since 1970, there has been very few large scale transportation projects implemented in the New York City metropolitan area, although this trend has reversed somewhat during the past decade with the availability of federal "New Start" funds for mass transit and innovative financing mechanisms.

The institutional changes that occurred subsequent to NEPA and the internal state institutional conflicts that it created greatly curtailed the power of the state (and private developers) to implement development projects in general and, in particular, large scale transportation projects in urbanized areas. The few mega-projects that were eventually implemented were carefully calibrated to avoid, to the maximum extent possible, any harm to the environment or surrounding neighborhoods.

The Balance of Power

The balance of power between state and local actors is an important contextual framework having a bearing upon the implementation of mega-projects and, in particular, how mega-projects are navigated through the maze of institutional conflicts at all levels of government. The Nassau Expressway project is presented as an example of how the balance of power affects the implementation of mega-projects in New York City. This mega-project is co-sponsored by the Federal Highway Administration (FHWA) and the New York State Department of Transportation (NYSDOT) as the lead agencies with New York City Department of Transportation as a key cooperating agency. Therefore, the discussions to follow will examine (briefly) the power relationship between federal agencies and NYSDOT and between New York City DOT and NYSDOT.

Federal and State Power Relationship

Under NEPA and other applicable federal laws and regulations, FHWA and other federal agencies exercise considerable control over local transportation development projects that use federal transportation funds through various institutions and organizations that govern and control the planning process, public involvement, the development of alternatives, the mitigation of impacts, and the adherence to sound and safe design standards. Any deviation from established design standards requires the preparation and approval of a 'Justification of Non-Standard Features Report'. The enforcement of federal environmental and design standards is exercised by withholding NEPA approval and federal funds for the project.

At the corridor planning level, the U.S. Department of Transportation (USDOT) requires a multi-modal 'Major Investment Study' (MIS) for all large projects to determine the best transportation solution in the study corridor. The MIS requires extensive public outreach and agency coordination, an arena that often pits mass transit advocates against highway interests.

At the Regional planning level, in order to qualify for federal funds for transportation, the US Department of Transportation requires urbanized areas with a population over 200,000 to have a Metropolitan Planning Organization (MPO) responsible for a regional planning program, a Regional Transportation Plan (RTP), and a Five-Year Transportation Improvement Program (TIP). The primary function of the MPO is to coordinate the transportation planning and programming activities of multiple inter-related agencies whose architecture conforms to an 'inter-organizational coordination (IOC) structure" described by Alexander (2005:218).

Most transportation mega-projects are, at least partially, funded by the federal government because their high costs are often beyond the means of local jurisdictions to handle without raising taxes, going deeper into debt, or diverting funds from other essential services. In order for the Nassau Expressway and other transportation projects to be eligible for federal funds, it must be included in the New York Metropolitan Transportation Council (NYMTC) RTP and the TIP. USDOT periodically recertifies NYMTC and other MPO's to make sure they are in compliance with all federal regulations. A determination of non-compliance may lead to a decertification and loss of hundreds of million dollars in federal aid per year.

The power of the federal government over the states with respect to planning and development plans is vast, combining elements of 'Reward Power' with 'Coercion Power'. These are power types described by French and Raven (1959) and referred to by Sotarauta (2009: 898).

'Reward Power' and 'Punishment Power' are used highly effectively by the federal government to organize, monitor, and control the internal and external behavior of organizations at all levels of government involved in the planning, development, and implementation of federally aided transportation projects. The involvement of the federal government in oversight and enforcement of its rules vary in accordance with the complexity of the project and the potential for environment and socio-economic impacts. As such, it is the ultimate protector of the public welfare.

In describing City-State relations, Hanagan and Tilly (2011:14) ascribe to Tilly the historical observation that 'power has shifted from cities to nation-states'. The enormous power of the federal government to direct the planning process at the local level seems to corroborate this empirical finding.

NYSDOT and New York City Power Relationship

Although the NYSDOT represents a higher State authority, there are a number of areas where the City influences the planning process and the preferred alternative that emerges from that process. The most significant control is in the area of land use and mapping which is governed by the City's Uniform Land Use and Review Procedures (ULURP), an institution created in 1970 by a City referendum approving the new City Charter. ULURP is triggered whenever there is a change in land use or there is a need to take private or public properties not previously acquired by the State. In addition, ULURP is necessary in order to map the roadbed of new transportation facilities or a realignment of existing facilities. There is some debate over whether the State, as a higher authority, is subject to ULURP. However, it has been the practice of NYSDOT to comply with the City's ULURP requirements, where applicable. Another area where the City exercises control is the approval of all transportation construction plans and the issuance of a work permit for construction. Again, there is some debate whether the State is actually required to obtain City approval of its construction plans, but as a matter of a policy of collaboration, NYSDOT submits all construction plans to the NYC Department of Design and Construction for review and approval. The City can withhold its approval entirely of any contract plans for any reason. The City, through its plan approval and permitting mechanism, is able to 'negotiate' extras that often increase the cost of the project. This type of behavior is described by Krueger (1974) as 'rent-seeking'.

The City seems to have the advantage in terms of the power relationship with the State but there are limits to the effective use of its power. If the City abuses its power, the State may choose to disinvest or minimize its investment in state-owned transportation facilities in New York City and divert its resources to a more hospitable environment. The City would then bear the consequences of the potential

political fallout, especially if a bridge scheduled for repairs were to be ordered closed by the State due to safety concerns. In the long-term, State disinvestment in transportation infrastructure would adversely affect the City's economy and, therefore, it is in the interest of both the City and the State to work cooperatively.

The interaction between the State and the City with respect to the implementation of transportation development projects is consistent with the power relationship described by Bryson and Cosby (1992: 13) and attributed by Sotarauta (2009: 897) as 'shared power with each party acting to further their separate and joint aims'.

In contrast to the Robert Moses era, the prevailing power relationships are decentralized and dispersed. The current power structure, under NEPA, is multi-polar and shared. Therefore, shared power must be aligned in the same direction, and maintained aligned through a lengthy approval process, in order to successfully navigate mega-projects through a complex web of institutional barriers. Otherwise, conflict develops and power is dissipated. And failure is not far behind.

Five case studies of mega-projects are presented in Chapters 5-9. They illustrate the use (and sometimes misuse) of power to aid or arrest the progress of mega-projects. The case studies offer a variety of issues, some of which are common to all mega-projects. In order to better understand why mega-projects (often) fail, examples of both successful and unsuccessful mega-projects are presented to get a better understanding of what works and what does not – and why. The five case studies provide a sense of why mega-projects (often) fail, but they are by no means definitive. In order to achieve that lofty goal, many more case studies would be required.

Chapter 5 – Nassau Expressway Project

Early Development History of the Nassau Expressway Project

The early development history of the Nassau Expressway is closely tied with both national and local historical events lending support to a path-dependent, historicist approach to understanding the current development plans and status of the project (Tilley 2010). But, the geo-history (Soja 2010) of growth and development of the Five Towns area and the nearby beaches is also important. The Nassau Expressway plan dates back to the late1940's during the Robert Moses era. The plan was originally intended to support recreational travel to the beaches at the Rockaways and Atlantic Beach. Later development of permanent year-round residential areas in the Five Towns and the Rockaways added increased pressure to provide better access.

In the 1950's, fueled by a post-WWII Fordist economy, the automobile and the oil industry, along with the unions, lobbied the federal government, a form of rent-seeking (Krueger 1974), to support increased spending for highways which led to the enactment of the Federal Aid Highway Act of 1956 – commonly known as the "National Interstate and Defense Highways Act." The linkage between a national highway system and national defense was perhaps intended to provide legitimacy to this new nation-state institution.

With the promise of "free" monies redistributed by the federal government, local planners rushed to develop a network of Interstate highways, partly based on old plans lying on the shelf. The Nassau Expressway was officially designated as I-878 with connections to the Bushwick Expressway, I-78, (abandoned) and the Clearview Expressway, I-295, (southern portion abandoned). The technical rationality (Goulet) dominated the early administration of the federal (and state) highway programs. An important requirement for qualifying for federal funds was the strict adherence to a set of design criteria which set national standards relating to design speed (70 mph), curvature, gradient, lane widths, shoulders, etc. The original design criteria were relatively easy to meet in rural areas, but imposed hardships on built-up urban areas.

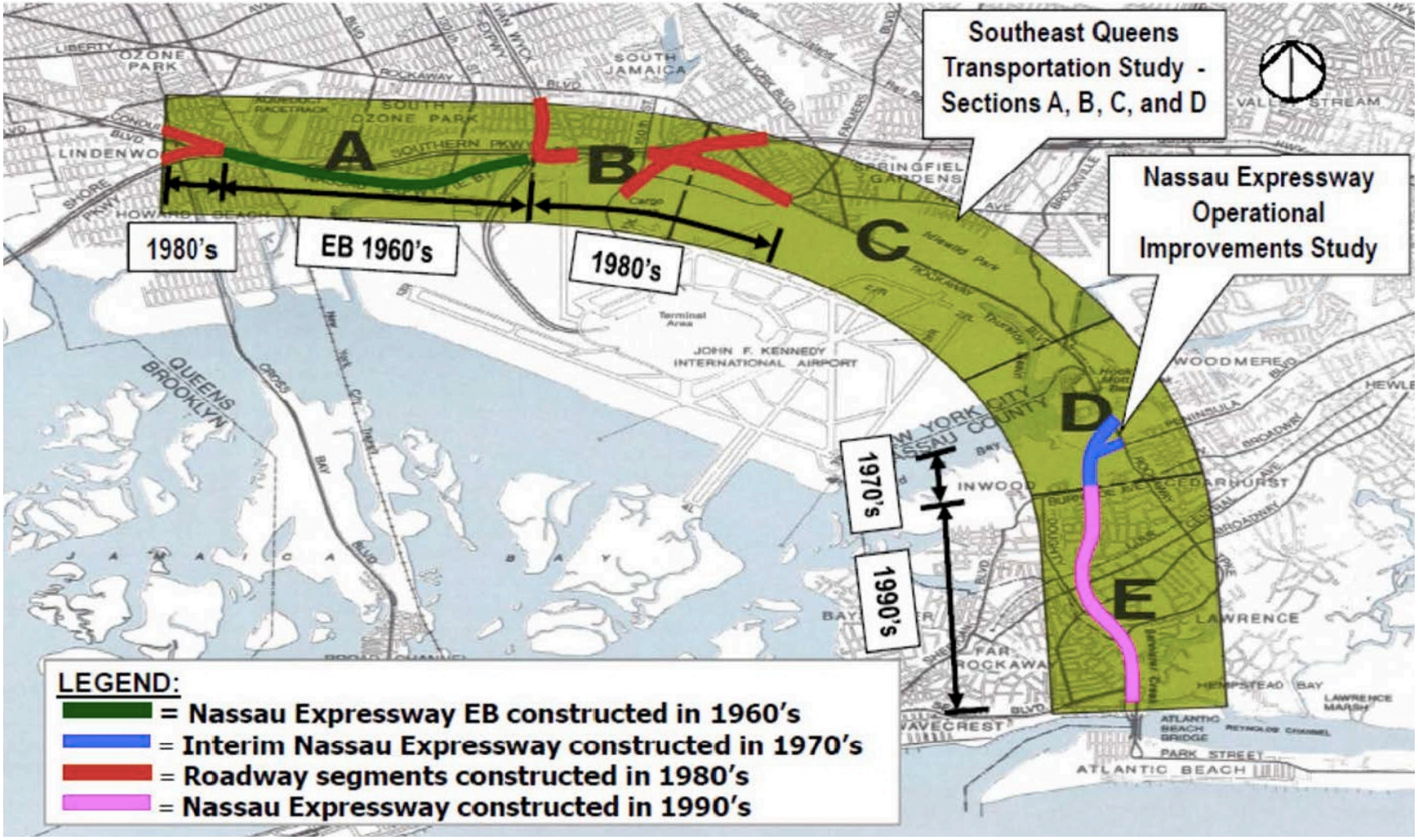
In the 1960's, the New York State Department of Public Works (NYDPW)[1], began the 'planning processes for the 10-mile Nassau Expressway, between Cross Bay Boulevard in Queens and Atlantic Beach in Nassau County. The planning process, at the time, consisted of determining the optimum alignment for the highway, based largely on engineering and cost considerations, followed by a pro-forma public hearing. Once the corridor alignment was approved (by NYDPW), it was free to proceed to final design, right-of-way acquisition, and construction without any additional public reviews. The record shows that NYDPW, following the public hearing, acquired about 275 acres of public and private right-of-way and designated an additional 100 acres to be acquired in the future. (1981 FEIS: IV-2). A comparison of the 1960 and 1970 census indicates that about 1700 residents were displaced from the Inwood (south) community (1981 EIS: II-13), about 40 percent of whom were minorities.

By the late 1960's the project was moving 'full steam ahead', with right-of-way-acquisition, final design, and construction proceeding simultaneously. Design plans were divided into five sections consisting of Section A, B, and C in Queens and Section D and E in Nassau County. See Figure 5-1. Section A, between Cross Bay Boulevard and the Van Wyck Expressway, was constructed in the late 1960's, but only in the eastbound direction. The westbound direction of Section A was never built.

National and local events were leading in a direction that would spell doom for the Nassau Expressway project. The national environmental movement and "freeway revolts", in the 1960's, led to the enactment of the National Environmental Policy Act of 1969 (NEPA), an example of 'path-dependent contingencies that shaped enduring structures' (Hanagan and Tilly 2011:13),which introduced new state institutions directly in conflict with those of the Interstate Highway Program (as well as other federally funded programs). As a result, many Interstate highway projects in the U.S. were halted, including the Nassau Expressway project.

[1] The NYDPW was merged into the New York State Department of Transportation in 1967

Figure 5-1
Development History of the Nassau Expressway



Source: Southeast Queens Transportation Study, New York State Department of Transportation, 2012

NEPA spawned complementary state and local institutions, namely the State Environmental Quality Review Act (SEQRA) and the New York City Environmental Quality Review (CEQR), to cover non-federal project actions.

The new state institutions at the federal, state, and local level altered the balance of power profoundly, making it much more difficult and costly to advance large, complex transportation projects. The conflict that originated between the state and civil society was, in effect, transferred to one between institutions within the state that govern the planning process and the development plans that emerge from these processes. The "embedding of the planning process" into society and the development plans that emerged from these processes was now complete.

Planning for the Nassau Expressway was restarted from the beginning in 1973 under the new NEPA and NYSDOT Environmental Action Plan[2] processes and completed eight years later in 1981. A review of the 1981 FEIS document reveals extensive agency coordination and public involvement throughout the eight year planning process. The project team headed by NYSDOT and complemented with a team of transportation and environmental consultants made a maximum effort to minimize the socio-economic and environmental impacts of the Nassau Expressway project in an effort to "do no harm". It should be noted that the greatest project impacts, the acquisition of most of the required right-of-way and the displacement of about 1700 residents, occurred prior to NEPA in the 1960's and, therefore, these actions were considered to be part of the baseline conditions rather than impacts attributable to the project. (It is highly unlikely that the Nassau Expressway planning effort would have restarted if the right-of-way was not already available.)

A large, complex project like the Nassau Expressway affords many opportunities for conflicts within state institutions. These conflicts mirror conflicts originating between the state and civil society that have now been largely internalized within state institutions in the form of laws, regulations, official policies, technical and non-technical standards, and procedures. The conflicts often involve multiple

[2] The Environmental Action Plan is an implementation of the State Environmental Quality Review Act (SEQRA)

political jurisdictions at various levels of government, each with its own institutional framework, priorities, and objectives.

Table 5-1 summarizes some of the major institutional conflicts encountered during the eight-year Nassau Expressway planning process, the organizations involved in the conflict, and the method of resolution. The definition of institutions generally conforms to Hodgson's (2006) formulation whereby institutions are 'systems of established and prevalent social rules that structure social interactions'. Unlike North (1987), Hodgson defines organizations as special institutions whereby its internal and external actions are determined by the institutions that are intrinsic to their organizational form and purpose. There is no separation between institutional norms and the actions that arise from those norms. North in a letter to Hodgson, however, distinguishes between internal and external actions of organizations, suggesting that organizations are institutions only with respect to internal actions and processes, but not within the framework of macro analysis (Hodgson 2006: 19). The discussion in this thesis treats state organizations as both institutions and actors in accordance with North's logic, recognizing that these organizations often make difficult decisions based on unique circumstances that sometimes transcend its institutional logic. Political influence also becomes a factor in determining an organization's response to ambiguous circumstances.

The most common institutional conflict for the Nassau Expressway project was between technical/design standards (technical rationality) and environmental standards (ethical rationality), in accordance with the planning rationalities described by Goulet (1986).

Wetlands impacts emerged as one of the most serious project concerns since this was the major issue that stopped the implementation of the original Nassau Expressway project. Executive Order 11990 – Protection of Wetlands (1974) requires that new construction in wetlands must be avoided unless there are no practicable alternatives and, if adverse impacts cannot be avoided, the project must include all practicable measures to minimize harm.

Table 5-1

Summary of Major Institutional Conflicts for the Nassau Expressway Project

No.	Institutional Conflict	Dominant Conflict Rationalities	Primary Approving Organizations	Other Approving Organizations	Conflict Resolution
1	Wetlands Impacts (Executive Order #11990) vs. Roadway Alignment (FHWA & NYSDOT Design Standards)	Technical vs. Ethical	FHWA and NYSDOT	Army Corps of Engineers, NYSDEC, Town of Hempstead Dept. of Conservation	Roadway alignment modified; impacts mitigated; new & improved wetland areas provided.
2	Parklands Impacts (FHWA Section 4f Policy Statement) vs. Roadway Alignment	Technical vs. Ethical	FHWA and NYSDOT	NYC Parks Dept., U.S. Dept. of Interior	35 acres lost; mitigated by park investments at another location.
3	Community Cohesion (23USC109(h)) vs. Roadway Type Design Criteria	Technical vs. Political	FHWA and NYSDOT	NYSDEC, Town of Hempstead Planning Dept.	Roadway type changed from expressway to at-grade boulevard
4	Noise Impact (23CFR Section 772.3) vs. Roadway Alignment Design Criteria	Technical vs. Ethical	FHWA and NYSDOT	NYSDEC, Town of Hempstead	Noise barriers installed at sensitive locations
5	JFK Airport Operation (FAA Standards) vs. Roadway Alignment	Technical vs. Technical	FHWA and NYSDOT	Port Authority, FAA	Roadway alignment was modified

Source: Nassau Expressway Project Final Environmental Impact Statement, NYSDOT, 1981

Wetlands impacts were minimized by altering the highway alignment to avoid wetlands wherever possible; bridging over wetlands where encroachment was unavoidable; and creating new and improved wetlands areas as part of the project. The project did result in a net loss of about 1 acre of wetlands out of the 330 acres in the project corridor. The FHWA Administrator, responsible for enforcement, determined that the wetlands avoidance and mitigation measures complied with the requirements of Executive Order 11990.

The major parklands affected by the Nassau Expressway project are in Section C, opposite Runway 22L/22R at JFK Airport. The original expressway alignment was south of Rockaway Boulevard and avoided mapped parklands. The Port Authority's runway extension plans and the Federal Aviation

Administration (FAA) clearance standards (governing runways) caused a conflict with the preferred NYSDOT roadway alignment. Failure to extend the runways would have forced some carriers to move their operations to other airports resulting in a loss of local jobs. The conflict was resolved when the alignment was shifted to the north side of Rockaway Boulevard. However, the resolution of the conflict with JFK operations required the taking of 36 acres of Idlewild Park, an undeveloped mapped park, causing another conflict within state institutions – namely the City and the State. The New York City Parks and Recreation Department requested, and NYSDOT agreed, to mitigate the loss of parklands by constructing a park at another location equal to the market value of the parklands to be taken. This three-way institutional conflict was resolved in a classic Coasian manner by negotiation among the parties (Coase 1960).

Community cohesion emerged as a major issue during the latter part of the study in Lawrence, where a predominantly Orthodox Jewish community objected to the expressway because it would have divided the community and prevented Sabbath observers from walking to the synagogue to worship with fellow congregants. The public participation record shows the involvement of many community groups and local elected officials who were opposed to the project.

The project team failed to consider ethnicity (Yiftachel 2000 and 2006) in its assessment of community cohesion early in the planning process. Scott's (1998) critique of the high-modernist approach to planning for generic 'unmarked citizens' may also be relevant here.

In response to public pressure, NYSDOT modified the roadway design in Section E, between Burnside Avenue and the Atlantic Beach Bridge, to an at-grade boulevard with a wide grassed median and a multi-use path in the shoulder area in accordance with an agreement reached with the community. The context-sensitive re-design of the roadway recalls the conflict between the 'one size fits all' design standards and 'local scale roads' described by Raitz and O'Malley (2004). The modified plan was less expensive and met transportation objectives in a manner that was sensitive to the community's needs. Section E was eventually constructed in the 1990's.

The involvement of elected officials in support of the community was instrumental in transforming a conflict between the state and civil society into a conflict that was also within the state. Had the conflict persisted, it would have escalated to the federal court system and, most likely, the project would have been delayed or stopped.

Noise impacts were determined to be significant in Section E because of the proximity of the roadway to nearby residences creating a conflict between federal (and state) noise standards and federal (and state) roadway design standards. The conflict was resolved by the installation of a noise barrier.

In summary, NYSDOT worked collaboratively with federal, state, and local agencies as well as community groups to resolve institutional conflicts that emerged during the planning process by employing flexible design policies, mitigation of impacts, and effective communication. The process is best described by Adaman and Devine (2001:231) as "…reconciliation through a process of democratic deliberative negotiation in the course of which plans change as more information is acquired and people become aware of the views and interests of others."

A Record of Decision (ROD) was issued by FHWA approving the Nassau Expressway Project in 1981 allowing the project to advance to final design and construction. It should be noted that the planning process, and the development plan that emerged from that process, was greatly aided by previously acquired (and cleared) right-of-way prior to NEPA in the 1960's, as the 1981 FEIS states that only three residences and no businesses would require relocation for the 10-mile roadway plan.

Although approval for the project was granted in 1981, after 8 years of planning, only Section E and a small portion of Section B have been completed to date since the inception of NEPA. The areas with the most severe congestion (and the highest construction costs), Section A in Queens and D in Nassau County, have not been completed due to a lack of funding.

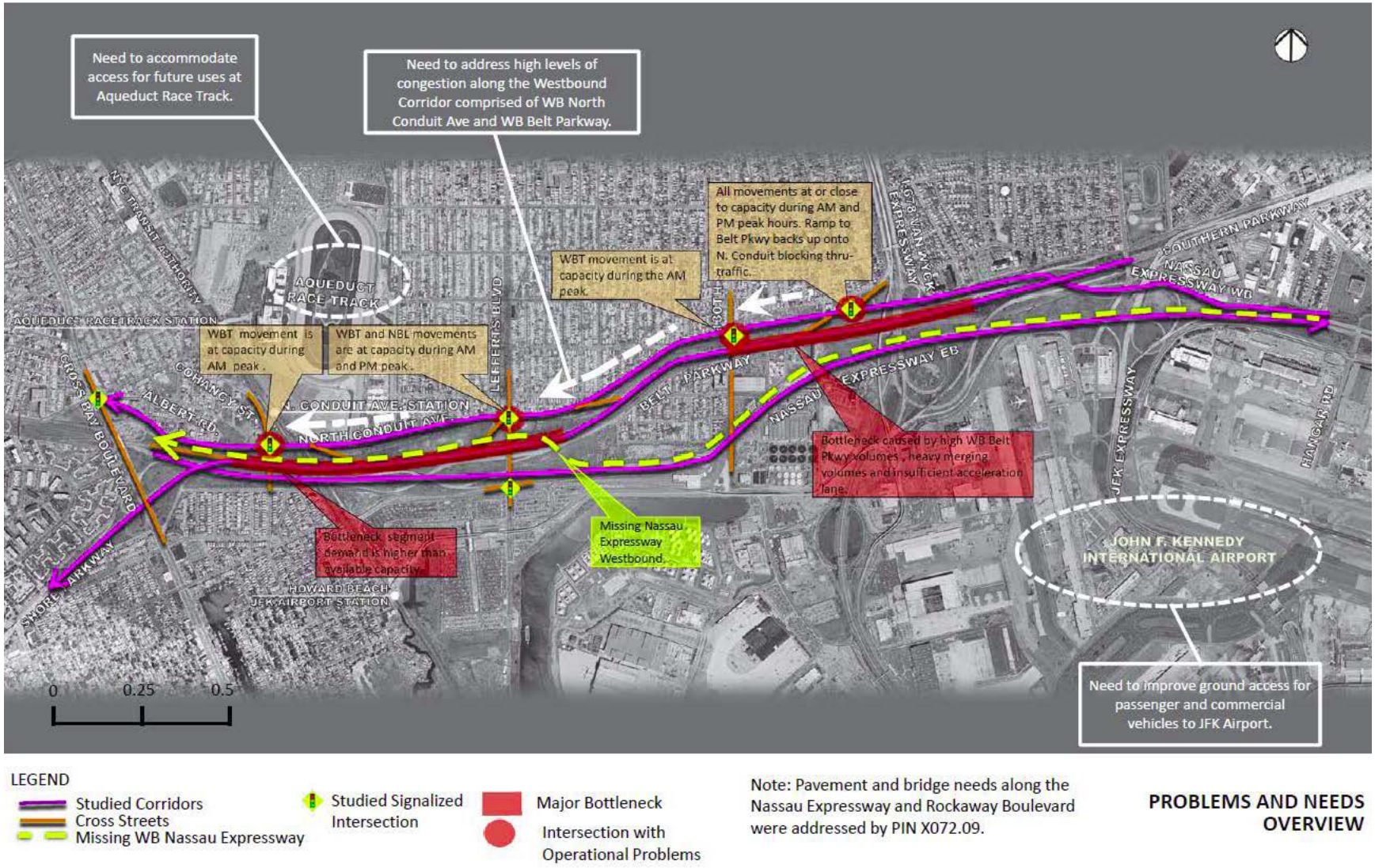
Recent Renewed Planning Efforts

After nearly a 30 year hiatus since the 1981 FEIS was approved, there was renewed interest in restarting the Nassau Expressway planning process to address chronic congestion and operational problems along the corridor. The planning process was restarted from the very beginning since the original 1981 FEIS was too old. A new planning study, called the Southeast Queens Transportation Study, was initiated by the New York State Department of Transportation.

The impetus for restarting the planning effort came in 2005 when State legislators included the study in a Memorandum of Agreement for the use of transportation bond monies. But the study did not gain traction until after 2008 when Republicans regained control of the State Senate and Dean Skelos, representing the 9th Senate District in southwest Nassau County, became Majority Leader. The new planning effort began in late 2009 when NYSDOT executed a $1.275 million consultant agreement with Stantec (formerly Vollmer Associates), a multi-disciplinary transportation consulting firm that prepared the original 1981 FEIS.

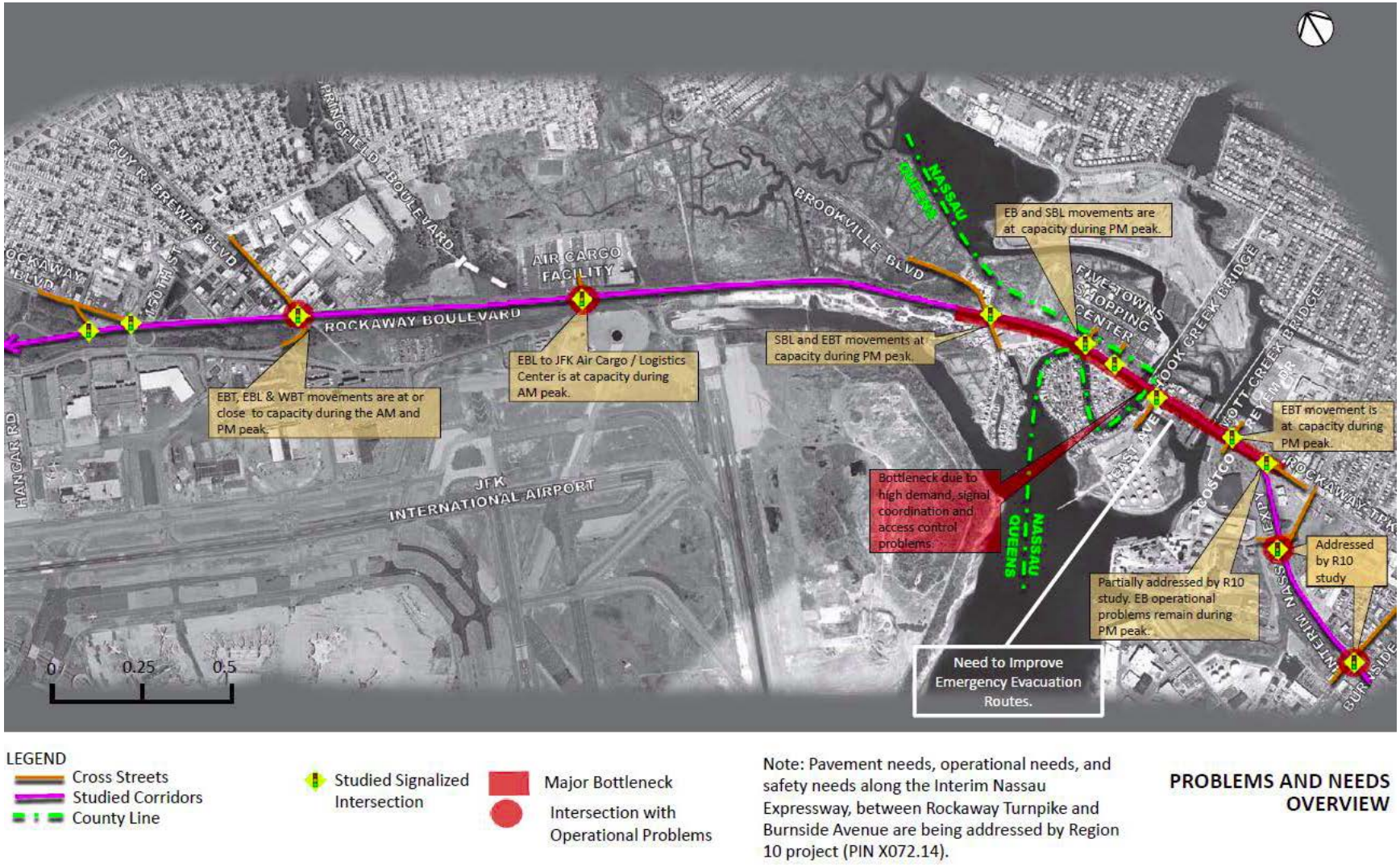
The new planning effort identified a number of transportation problems and needs along the Nassau Expressway corridor including congestion, operational problems, and accident rates higher than the statewide average. The 'missing' westbound Nassau Expressway in Queens creates a lane imbalance causing severe congestion along the eastbound Belt Parkway and North Conduit Avenue. Since trucks are not allowed on the Belt Parkway, they must use North Conduit Avenue, a congested arterial roadway with traffic lights. In the eastern portion of the corridor, there is severe congestion along Rockaway Boulevard (Queens) and Rockaway Turnpike (Nassau County). Forecasted traffic growth along the corridor is expected to exacerbate existing congestion levels and increase the number of hours of congestion. See Figure 5-2 and Figure 5-3 showing the study area and the corridor problems and needs identified in the Project Scoping Report.

Figure 5-2: Nassau Expressway Problems and Needs – Cross Bay Boulevard to JFK Expressway



Source: Southeast Queens Transportation Study – Project Scoping Report, New York State Department of Transportation, 2012

Figure 5-3: Nassau Expressway Problems and Needs –JFK Expressway (Queens) to Burnside Avenue (Nassau County)



Source: Southeast Queens Transportation Study – Project Scoping Report, New York State Department of Transportation, 2012

The objective of the ambitious study was to develop a plan for a multi-year, phased capital program to address transportation problems and needs along the corridor. An important requirement was to ensure that the alternatives do not preclude future implementation of the 1981 FEIS Plan and, if possible, identify elements of the original plan that have independent utility and could be advanced as a separate project. A Draft Project Scoping Report, an initial planning report, was completed in February 2012 in accordance with NEPA and NYSDOT Environmental Action Plan procedures. The study report contained a full-range of conceptual alternatives that included short-term, mid-term, and long-term solutions. The mid-term and long-term concepts improved access to the Five Towns and JFK Airport. The long-term concepts significantly reduced congestion along the westbound Belt Parkway and North Conduit Avenue, both roadways under the jurisdiction of the New York City Department of Transportation (NYCDOT). Due to the State's deteriorating financial situation, NYSDOT refocused its attention to short-term, low-cost solutions within its funding capability. The further consideration of mid-term and long-term conceptual solutions, ranging in cost from $10-85 million, was deferred even though the costs are relatively modest when compared to the estimated $600-800 million cost (in current dollars) to complete the original 1981 FEIS Plan.

Informal discussions were held with two of the major project beneficiaries, NYCDOT and PANYNJ, to explore the possibility of sharing costs. While both agencies expressed support for the long-term concepts, they indicated that they too were experiencing financial difficulties and, therefore, could not participate in funding.

The lack of funding is paramount and it continues to be the main obstacle preventing progress towards the full implementation of the original 1981 FEIS Plan for the Nassau Expressway. The funding situation is exacerbated by the recent recession and the focus of highway transportation improvement expenditures on preserving the existing transportation system, including capital maintenance and emergency repairs. There is no dedicated funding for highway capacity improvements and the Nassau Expressway project must compete with higher priority infrastructure renewal projects. Another factor that

complicates the funding for the Nassau Expressway is that the project is located in two different political jurisdictions and two different NYSDOT regional offices, each with a different constituency and different priorities.

In order for the Nassau Expressway to move forward, monies would have to be specifically earmarked for this project through new funding sources targeted at highway capacity improvements. Most likely, borrowing would be required and agreements reached on how to use the monies. The Memorandum of Agreement signed by state legislators subsequent to voter approval of the 2005 Rebuild and Renew Transportation Bond Act earmarked $40 million for Nassau Expressway improvements. This money is still (theoretically) available, but it is not sufficient to fully fund any major improvements. Given New York State's current fiscal situation, and already high debt service obligations, it is unlikely that a new Transportation Bond Act with significant system expansion/capacity improvement provisions would be placed on the ballot in the near future and even more unlikely that voters would approve such a ballot.

Lessons Learned:

- Lack of funding was the major obstacle to successful project implementation even after project approval has been granted under NEPA.
- Mitigation and/or avoidance of impacts are the primary mechanism for resolving institutional conflicts within the state.
- An effective community and agency participation process is one that responds to concerns raised by stakeholders and makes adjustments to the plans accordingly.
- The planning process, while extremely slow, did eventually lead to an approved alternative after eight years.
- The lack of sufficient funds to maintain the existing transportation system in a state-of-good repair would make it difficult to identify funds for the Nassau Expressway Project.

Chapter 6 – The West Side Highway Project (Westway)

The $2.1 billion[1], 4.2 mile long, Westway project was initiated in the early 1970's around the same time the Nassau Expressway planning process had restarted under NEPA, but the planning for the two mega-projects differed if not in the actual process then in the manner in which the planning process was executed. Both mega-projects were system expansion projects as part of the Interstate Highway Program funded with 90 percent federal monies and 10 percent state/local funds. The funds for Westway were (initially) fully committed to the project while the Nassau Expressway project competed for funding with other highway projects. The physical, socio-economic, and environmental context in which the NEPA planning process was executed was quite different for the two mega-projects. The Nassau Expressway project adjusted to its implementation context successfully while Westway did not.

The Westway project was intended to replace the defunct[2] 4-lane elevated West Side Highway which traversed over West Street, between 42nd Street and the Battery in Manhattan, with a 6-lane highway, built to Interstate standards, located largely in new landfill . The new highway would have been mostly out of sight either in a tunnel or below grade in a cut section, but large ventilation tunnels would have intruded on the shoreline view. The highway plan was accompanied by a massive redevelopment plan on the new landfill which included commercial, retail, and residential uses. About 90 acres of landfill was designated for parklands. See Figure 6-1a and Figure 6-1b showing the Westway alignment and the associated development plans along the west side of Manhattan.

In contrast to the Nassau Expressway, the availability of funding was not an issue for Westway until the latter stages of the project when the dedicated 90 percent federal Interstate funding committed to the project was eventually 'traded-in' for mass transit and reconstruction of West Street as an alternative to Westway.

[1] 1981 dollars

[2] The West Side Highway was closed in December 1973 when a dump truck crashed through a northbound section in the vicinity of Gansevoort Street.

Figure 6-1a: Westway Development Plan, 14th Street to 42nd Street

Source: 1984 Supplemental EIS, West Highway Project, NYSDOT

Figure 6-1b: Westway Development Plan, Battery to 14th Street

Source: 1984 Supplemental EIS, West Highway Project, NYSDOT

Although the Westway project was fully funded and enjoyed strong support from the governor(s), the mayor(s), and the business community, it is widely regarded to be a huge failure in terms of process, if not in the ultimate outcome.

A review of the public record contained in the 1984 Final Supplemental EIS and interviews with several staff who worked on the Westway project indicate that the relationship with the community was contentious and characterized by a lack of trust. One interviewee described the attitude of the NYSDOT project team toward the community as 'condescending'. Another interviewee described a 'compartmentalized' project team suggesting a top to bottom, authoritarian management style. This appeared to carry over into the community participation process with one interviewee stating that community views were not seriously considered. The tone of the official responses to public comments contained in the EIS appears to corroborate a lack of sensitivity to concerns raised by the public as indicated by a 'legal style' rebuttal of comments raised by the community. One interviewee described it as a "we know best" attitude. This type of interaction tends to lead to diminished public trust and ultimately to open conflicts with the community.

In contrast to Westway, the Nassau Expressway project team was able to build and maintain a trusting relationship with the community by responding to its concerns and demonstrating a willingness to work with the community to modify the design of the project. Although there were many Westway public meetings, there is little evidence to indicate that the project team engaged the community in a cooperative and collaborative planning process. The "Westway Plan", along with the proposed massive development on new landfill, had all the characteristics of a centralized planning process reminiscent of the Robert Moses era but in the guise of NEPA.

While meaningful public participation facilitated by a project team that is sensitive to community issues is an important determinant of project implementation success, it cannot by itself overcome fundamental flaws in the project plan that are at variance with the values of the community.

The following is a partial list of community concerns documented in the Final Supplemental EIS, Volume III, Comments and Responses – November 1984:

- Massive new development along the Manhattan west side would have a significant adverse effect on community character.
- Negative economic effect on existing property owners and retail businesses
- Impact on historic brownstone areas in Chelsea and Greenwich Village
- "Westway is totally insensitive to the development rights of other communities."
- Impact on historic resources
- "Westway will destroy existing waterfront and piers"
- Concerns about higher traffic levels and air quality
- Visual impacts due to ventilation towers and new development
- Impact on fish habitat (striped bass)
- Impact on marine transportation/shipping
- Poor use of public funds; monies would be better spent on improving mass transit.

The concerns expressed by the community were not addressed by the Westway project team to the satisfaction of the community. This led to the formation of organized opposition to the project. Opponents of the project can be cast into two general categories: 1) 'use value' opponents and 2) 'exchange value' opponents.[3] 'Use value' opponents represent residents, visitors, and environmental groups who view the project affecting the use and enjoyment of public and private resources negatively and having a generally adverse impact on the quality of life. 'Exchange value' opponents are property owners and owners of businesses who view the proposed project adversely affecting their economic status. In some cases, for instance residents who own their property, opponents are potentially both 'user' and 'exchange' opponents. The highly dense west side of Manhattan offered an ideal environment for

[3] This is an adaptation of Karl Marx's discourse on use value and exchange value of commodities.

both ‘user value’ and ‘exchange value’ stakeholders, to mobilize effectively and is believed to be a contributing factor to Westway’s demise.

The Westway project team did not fully comprehend the implications of the 1969 National Environmental Policy Act (NEPA) which fundamentally altered the balance of power between the state and civil society with respect to the implementation of projects using federal funds. NEPA gave community groups and other groups not directly affected by a proposed federal action the right to sue the project sponsors. Although later court decisions somewhat curtailed the right of non-affected parties to sue, this has become a powerful weapon in the hands of project opponents to stall mega-projects and to eventually stop it altogether.

The Westway project sponsor was sued in federal court several times attacking the validity of the environmental study process, the validity of data used in the study, the validity of assumptions used in the study, the analytical methods used, and the results and conclusions that came out of the study. The lawsuit even attacked the integrity of the project team, accusing it of manipulating the data and the study results. The breakdown of trust was complete.

A key figure leading the Westway opposition group was Marcy Bienstock, president of the Clean Air Campaign. Ms. Bienstock was able to form partnerships with other environmental groups, local elected officials, and even New Jersey elected officials to oppose the Westway project. The Clean Air Campaign filed a lawsuit against the Westway sponsors challenging the issuance of an indirect source permit. While the Westway project eventually overcame this lawsuit, it was sufficiently delayed for ant-Westway forces to find other avenues of opposition.

At the request of the community, the court ordered the hiring of a Community Engineer, at the state’s expense, to help analyze the environmental studies and advise the community. Invariably, there were many differences in assumptions and opinions between the state’s engineering team and the Community Engineer creating even more confusion, conflict, and distrust.

The endless delays began to take a toll on the project as political support began to erode and the controversy generated by Westway made it a political liability to support the project.

The beginning of the end of Westway came when federal regulations governing the use of Interstate Highway monies from the Highway Trust Fund were changed to allow trading-in the Westway funds for mass transit and other highway projects. The 'dedicated' funds, which are so critical to successful project implementation, were no longer specifically reserved for Westway. These monies could now be used for other purposes. This created new opposition groups who competed for the potential Westway trade-in monies.

The poor condition of the MTA system as well as unmet highway infrastructure needs contributed to the impetus to trade-in the Westway funds. In 1986, after 15 years of contentious planning, the Westway project was dropped from the Interstate Program. About 60 percent of the trade-in monies, about $1.1 billion, were allocated to mass transit and the remaining funds, about $800 million, were used to construct a 'boulevard' alternative to Westway generally within the West Street right-of-way, a concept that was advocated by many members of the community.

Subsequent to the Westway trade-in, a new planning effort was undertaken by NYSDOT to develop alternatives that avoided filling in the Hudson River and excluded any major new development. (The community was finally heard!) An entirely new multi-agency project management team was formed by NYSDOT that included representatives from the City, State, and the Federal government. The previous 'monolithic' Westway management team was replaced by a multi-agency collaborative effort. There were weekly management meetings that served to obtain input from stakeholder agencies and to reach a consensus. The community participation style also changed (for the better). Community input was taken seriously and the project benefited from that input. The community requested, and obtained, certain amenities such as use of the piers for recreational purposes, a multi-use pedestrian walkway/bikeway, and pedestrian bridges over West Street. NYSDOT hired a landscape architect to work with local community

groups to develop landscaping features, streetscaping, and new lighting that fit in with the character of the community. A measure of trust was restored.

Some may argue that the Westway project did not fail because, ultimately, the planning process (after a total of 20 years) produced an acceptable smaller scale mega-project which was successfully designed, funded and built. Others would argue that the downfall of Westway was a huge lost opportunity to redevelop the west side of Manhattan, provide better access to the waterfront, reduce traffic delays, and provide (even greater) amenities for the local community. At the very least the process failed, if not the eventual outcome.

Would better communication and a modicum of trust resulted in a different Westway outcome? Could Westway, or some variation, have been built if the mega-project was scaled down or the highway transportation portion was separated from the contentious land use issues, allowing the community and the City to resolve it over time? Would it have been more advantageous to present Westway as an infrastructure renewal project (replacing the old dilapidated elevated West Side Highway) rather than a major capacity improvement?

Perhaps the fatal flaw was that the Interstate funding source was initially too restrictive in its allowable uses for the planning process to reach a logical conclusion. The funding source pre-determined the outcome – an Interstate highway built to Interstate standards. Once the trade-in legislation was passed, allowing more flexible uses of Interstate funds, a wider range of options could be considered seriously during the planning process.

Are we better off without Westway? The west side of Manhattan did get redeveloped (and is still developing) but not in the image of Westway planners. The air quality issue, the subject of much controversy and a major lawsuit, turned out to be a non-issue since motorized vehicles have been getting much cleaner and are likely to get even cleaner.[4] And traffic along a reconstructed West Street has

[4] According to EPA figures, air pollution nationally declined 81% between 1970 and 2010 while vehicle-miles traveled doubled.

become severely congested, even without the traffic that the redevelopment associated with the Westway project would have generated. Recreational facilities, bikeways, walkways, and parks constructed along the waterfront in conjunction with the post-Westway reconstruction of West Street as an arterial boulevard are abundant and well used. The striped bass population living in the area that was supposed to be filled in by the Westway project, also the subject of much controversy and a major lawsuit, are presumably doing very well.

Some lessons learned from Westway and post-Westway planning efforts:

- Mega-projects inherently trigger public wariness and distrust because of the potential for significant impacts and the uncertainty it creates in people's lives. The Westway planning process failed to overcome public distrust because of a perceived lack of response to the community's concerns.
- The effects of a mega-project are intensified in a dense urban setting, like Manhattan, where impacts are more difficult to avoid or mitigate.
- Trust among stakeholders is essential to successful project implementation, especially for mega-projects.
- A lack of trust can lead to active community opposition.
- Trust increases when stakeholders perceive its concerns are taken seriously; conversely, trust decreases when stakeholders perceive that their concerns are ignored.
- A long, drawn-out planning process and project reviews allows opposition time to mobilize and stop (or further delay) the project.
- Mobilization of community opposition is enhanced by density (but recent technological innovations and social networking via the internet provide an effective means for mobilization of opposition in less dense areas).

- Funding should not be taken for granted. It can always disappear, especially if there is community and political opposition.
- Restrictions on uses of Interstate funding influenced the outcome of the Westway planning process which favored an Interstate highway solution. The funding restrictions did not allow modification of the project design to address community concerns.
- The post-Westway collaborative planning process restored a measure of public trust and resulted in the successful planning and implementation of a scaled down mega-project that was acceptable to the community and other stakeholders.

Chapter 7 - Kosciuszko Bridge Replacement Project

The 1.1 mile Kosciuszko Bridge carries the Brooklyn-Queens Expressway (BQE/I-278) over the Newtown Creek, connecting Brooklyn and Queens, with daily traffic volumes of over 160,000 vehicles. See Figure 7-1 showing the existing Kosciuszko Bridge over Newtown Creek. Project scoping was initiated in 1999 to address low bridge condition ratings from the biennial bridge inspections. The project scoping study, completed three years later in 2002, identified several problems including structural deficiencies, high accident rates and excessive delays. The scoping study recommended bridge replacement because rehabilitation of the existing structure, nearly 70 years old, was not considered practicable. An EIS was completed in 2008 and a Record of Decision was issued in 2009. The planning process took a total of 10 years.

The preferred alternative, BR-5, calls for replacing the existing 8-lane bridge with three side by side bridges with a total of 9 lanes. The westbound (southbound) structure would carry four lanes plus a 13' wide pedestrian walkway and bicycle lane. The width of this structure would be about the same as the existing Kosciuszko Bridge but it would be situated about 15 feet lower to reduce the steep grades and poor sight distances that contribute to congestion and high accident rates. Two separate structures, east of the westbound structure, are proposed to carry the eastbound (northbound) lanes. The first structure would carry 2 through lanes to the BQE and the second structure would carry 'local' lanes and function as a collector-distributor roadway with two of the lanes exiting to the LIE. See Figure 7-2 showing the proposed lane configuration. The construction cost is estimated at $1.2 billion.

The community participation program started early during the scoping process. The project goal was to replace the 70 year old structure which was rated "poor" to "fair" by the state's engineers and deemed functionally obsolete because it lacked shoulders and had a number of other non-standard features. Because of the extent of deterioration, reconstruction of the bridge was deemed to be not economically viable. Another factor that entered into the decision to replace the bridge rather than

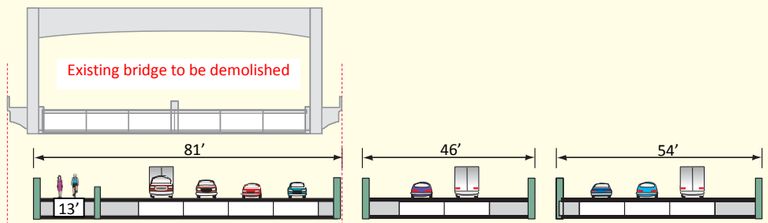
rehabilitate it was the lack of shoulders on the existing bridge to accommodate traffic during construction. Reconstruction of the existing bridge would be expensive and it would not correct operational and safety deficiencies. And traffic would be backed up for miles during construction because there is no reserve capacity on the bridge and no nearby alternate routes. A new bridge was the only solution.

The initial community reaction was, understandably, one of apprehension and distrust. The community, almost immediately, requested that NYSDOT hire a Community Engineer to review the environmental studies and to advise the community. The NYSDOT project team resisted falling into the same trap as Westway and, instead, offered to work closely with the community to address its concerns. Over a period of time, NYSDOT staff developed and maintained a very good working relationship with the community and gained the community's trust. The desire for a community engineer diminished considerably as the state's planners and engineers were viewed to be responsive to the community's concerns and made changes to the plan accordingly. The main concerns were traffic, noise, and air quality impacts during construction, hazardous/toxic materials in the project area, redevelopment of polluted Newtown Creek as a recreational facility, dislocation of several businesses, and parklands impacts. These issues were mostly resolved in a satisfactory manner. However, the redevelopment of Newtown Creek as a recreational facility was deemed to be beyond the scope of the project.

Figure 7-1
Kosciuszko Bridge over Newtown Creek

Source: http://upload.wikimedia.org/wikipedia/commons/0/0e/Koscnewtown.JPG

FIGURE 7-2
KOSCIUSZKO BRIDGE PREFERRED OPTION BR-5



Source: Kosciuszko Bridge Final Environmental Impact Statement, NYSDOT - 2009
Executive Summary – Figure ES-7

A key to the (eventual) planning success of this mega-project was the ability of the project team to present it as an infrastructure replacement project rather than a capacity project since these type of projects are more compelling. This was not difficult. The Kosciuszko Bridge was in poor condition and the consequences of unscheduled bridge closures to perform emergency repairs on the local community and the traveling public was readily apparent. The increase in in the number of lanes was viewed as an operational improvement because of capacity constraints upstream and downstream of the bridge.

A review of the public comments and the NYSDOT responses indicates a cooperative and collaborative relationship between NYSDOT and community and outside agency stakeholders. NYSDOT made a good faith effort to address community and NYC agencies' concerns.

Local community acceptance of the mega-project was made easier by a number of important benefits that NYSDOT agreed to provide, the most important of which were the full mitigation of park impacts by providing four times as much replacement park area than was being taken for the project and the remediation of several nearby hazardous waste sites. In addition, NYSDOT agreed to construct a bikeway/walkway along the westbound side of the new Kosciuszko Bridge, launches for small non-motorized boats on each side of Newtown Creek, improved streetscaping (including plantings, reconstructed sidewalks, and new street lights), and improved pedestrian safety measures on local streets below the bridge.

The commitments made by NYSDOT to the community and stakeholder agencies were incorporated into the Final EIS and the Record of Decision and are binding obligations upon the state that must carried out in the design and construction phases of the project.

A review of the public participation process contained in the Final Environmental Impact Statement indicated that there was extensive outreach to community groups, outside agencies, public interest groups, local businesses, and elected officials.

Two advisory committees were formed – a Study Advisory Committee (SAC) and Interagency Advisory Committee (IAAC). The SAC consisted of the general public, community groups, community boards, and elected officials. The IAAC consisted of representatives of federal, state, and local agencies that have jurisdiction in terms of issuing permits and sign-offs.

The outreach program included approximately 150 meetings:

- 35 SAC meetings
- 20 IAAC meetings
- 2 public scoping meetings
- 9 open houses
- 42 small group meetings
- 3 community bus tours
- 34 site visits and meetings with businesses potentially impacted
- 2 public hearings

What is remarkable about this potentially 'successful' infrastructure renewal mega-project is that it went 'very smoothly', but it took so long to get through the NEPA process – a total of 10 years from the identification of serious structural issues to a Record of Decision. The project is currently in the final design phase. Most likely, it will take another 10 years to complete the final design and construction phases, assuming that sufficient funding resources are available.

One interviewee was asked 'why it took 10 years to complete the planning process for the Kosciuszko Bridge project. The response was that 'there were no unusual problems –there was just a lot to do.'

Table 7-1 shows the list of permits and approvals required from federal, state, and city agencies prior to the construction phase. These permit applications are normally reviewed during the final design stage.

Table 7-1
Permits and Approvals Required Prior to Construction

AGENCY	NEED FOR PERMIT/APPROVAL
U.S. Coast Guard	Kosciuszko Bridge is over a navigable waterway (Newtown Creek)
U.S. Army Corps of Engineers	Dredging and other construction activities in Newtown Creek
New York State Department of Environmental Conservation	Handling, storage, and transportation of hazardous materials, soils, water, and dredged materials during construction; storm water runoff into Newtown Creek.
New York City Department of Transportation	Short-term closure of lanes and local streets during construction; construction work permit.
New York City Department of City Planning	ULURP, land use mapping
New York City Department of Parks and Recreation	Removal and/or pruning of trees; construction within Sergeant William Dougherty playground.
New York City Department of Environmental protection	Maintenance of existing connection to storm water and sanitary sewer systems.

Source: Kosciuszko Bridge Replacement FEIS, Executive Summary, NYSDOT 2008

The permitting agencies listed above were involved early in the planning process as members of the IAAC and provided valuable input that was considered in the development of alternatives and the selection of the preferred alternative. Because the agencies were involved early, there should not be a difficulty in obtaining the permits and approvals needed to start construction. However, most permits stipulate conditions under which the permits will remain valid and the sponsor is bound to comply or the permit may be revoked.

The Kosciuszko Bridge Replacement project illustrates that the NEPA planning process is workable, but extremely time-consuming. The long duration of the planning process is attributable to the requirements of NEPA but also to the complexity of working in a dense urban environment. Even though the Kosciuszko Bridge Replacement project would functionally replace an existing structure, admittedly with improved operational and safety characteristics, the NEPA process is essentially the same as a major system expansion project.

Consideration should be given to modifying the NEPA process for infrastructure renewal projects where the preferred alternative is 'obvious' – replacement of an aging and obsolete bridge carrying a major highway. The community outreach and agency coordination can be done effectively during the scoping phase and it can be continued during the design and construction phases as needed. The development of alternatives and cost estimates typically done during the scoping phase could be performed at the preliminary design level. And the assessment of socio-economic and environmental impacts can be done mostly qualitatively during the scoping phase as well. No need to prepare a time-consuming and expensive EIS when the impacts are generally known during the scoping phase and no need to wait 10 years to determine that the Kosciuszko Bridge needs to be replaced. This is a waste of taxpayer dollars. (Robert Moses would be turning over in his grave.)

There are other major structures in the region reaching the end of their useful lives such as the Goethals Bridge, the Tappan Zee Bridge, the Gowanus Expressway viaduct, the BQE triple layer cantilevered structure in Brooklyn Heights, and many other structures. These bridges are 'ticking time bombs'. They can't be maintained forever and sooner or later they will need to be replaced.

Funding is a critical issue, even for infrastructure renewal projects. Based on discussions with NYSDOT staff, funds have not been identified to fully fund the Kosciuszko Bridge Replacement project. Only the first phase of construction is funded in the current five year capital program. The remaining phases are in the Post-2017 fiscal year period.

Based on discussions with NYSDOT staff, the EIS's for the Gowanus Expressway and the BQE cantilever section have been terminated due to a lack of funding. NYSDOT is implementing a $400 million 'interim emergency repair' of the Gowanus Expressway viaduct. A similar strategy will be employed for the BQE cantilever structure. If funds for the Kosciuszko Bridge Replacement are not identified, 'emergency interim repairs' will most likely be considered.

The time-consuming NEPA process combined with a lack of funds for critical infrastructure renewal projects presents a serious challenge to the health of our transportation system and the economic vitality of the New York City metropolitan area. The future looks bleak with more unscheduled closures of critical transportation links to perform emergency repairs and a growing tendency by transportation operators to schedule expensive "interim repairs" that do little to improve the performance of our transportation system.

Lessons learned from the Kosciuszko Bridge replacement Project

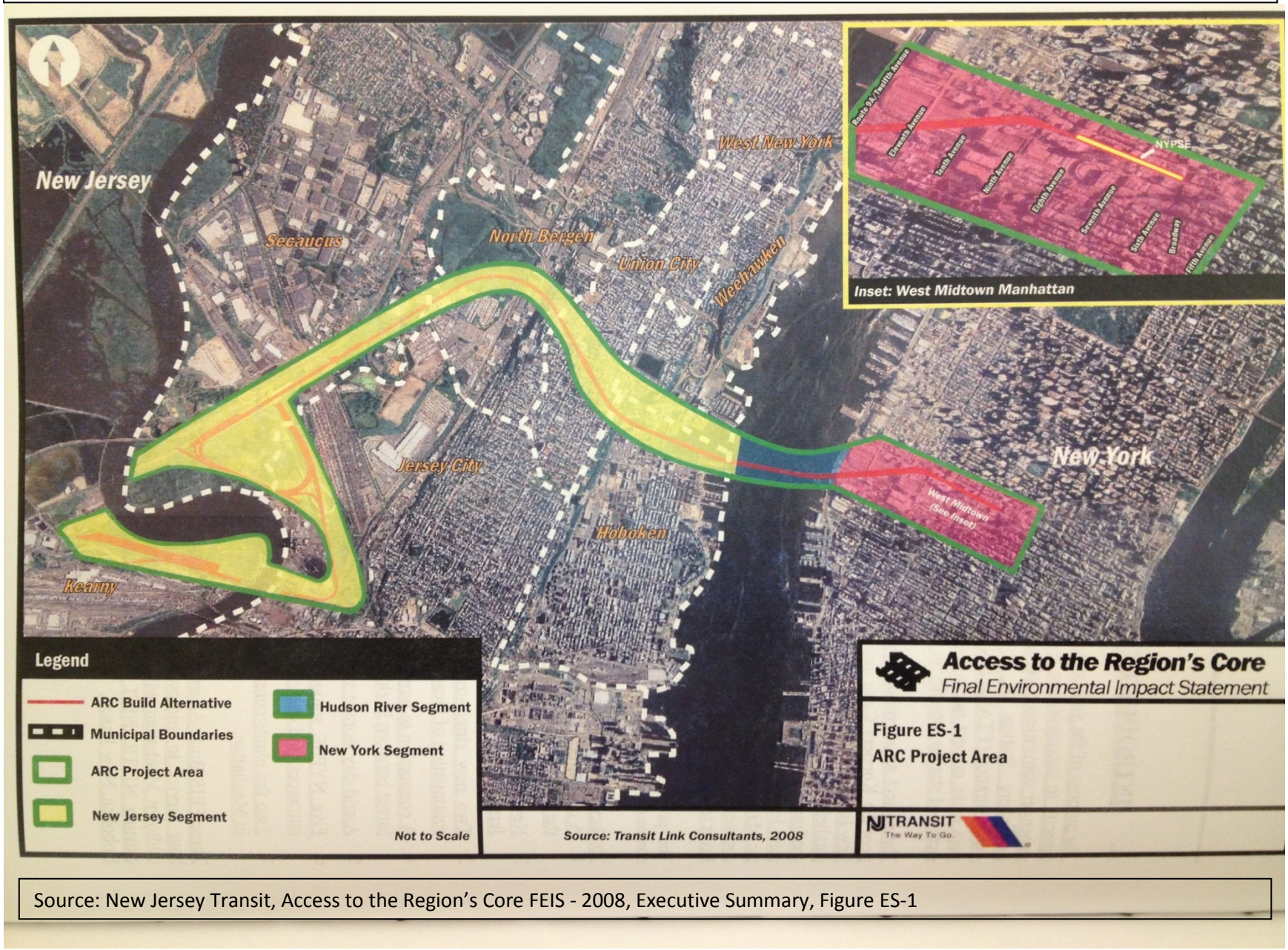
- Mega-projects are initially met with a degree of skepticism and distrust as evidenced by a request for a Community Engineer early in the planning process.
- Over time, as the community experiences positive interactions with the project team, trust can be built and an effective partnership can be established.
- Providing community amenities will improve community acceptance of the project (but drive up costs).
- The planning and environmental review process for critical infrastructure renewal mega-projects, even those with little impacts, takes a long time.
- There is a shortage of funding for critical infrastructure renewal or replacement projects like the Kosciuszko Bridge.

Chapter 8 – Access to the Region's Core (ARC)

The Access to the Region's Core (ARC) Project is one of the largest mass transit projects in the nation. (See Figure 8-1.) This nine mile, $8.7 billion 'super' mega-project would double train capacity from New Jersey into New York Penn Station to accommodate growing New Jersey Transit (NJT) rail ridership, relieve rail traffic congestion, provide a transfer-free ride for passengers on the NJT Main, Bergen, and Pascack Valley commuter lines, and reduce vehicular traffic into Manhattan. The ARC project would construct two new rail tunnels underneath the Hudson River connecting to an extension of Penn Station deep underneath 34th Street. In order to achieve the full capacity and operational benefits of the ARC project an additional $1.2 billion investment would be required to replace the "Portal Bridge" carrying Amtrak and NJT trains over the Hackensack River.

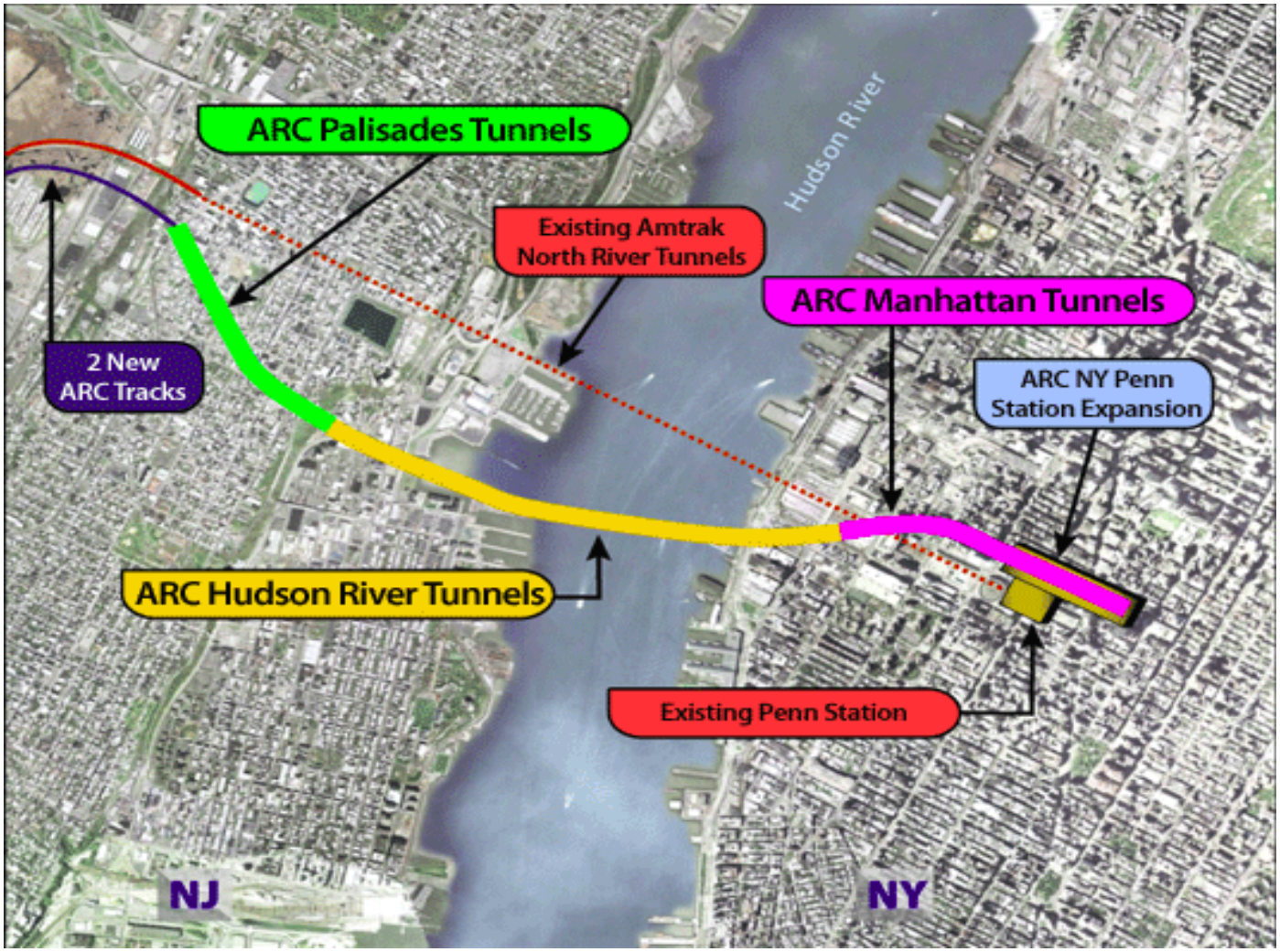
The ARC project has a long development history that began officially in 1995 when the Port Authority sponsored a Major Investment Study (MIS) in collaboration with the Metropolitan Transportation Authority (MTA) and New Jersey Transit (NJT). The MIS reviewed 137 alternatives including bus, rail, ferry, and auto modes that were eventually narrowed to just two rail alternatives into Penn Station. The MIS took four years to complete. In 2003, New Jersey Transit commenced a feasibility study of the alternatives identified in the MIS and recommended two new single track rail tunnels underneath the Hudson River. The feasibility study also took four years to complete. The Environmental study also began in 2003 in parallel with the feasibility study. A draft EIS was issued in February 2007 and a Supplemental Draft EIS was issued about a year later in March 2008 due to significant changes in the project. The Final EIS was completed in November 2008 and a Record of Decision, approving the ARC project, was issued by the Federal transit Administration (FTA) in January 2009 after nearly 14 years since the start of the planning process in 1995.

FIGURE 8-1 ACCESS TO THE REGION'S CORE – ARC PROJECT STUDY AREA



Source: New Jersey Transit, Access to the Region's Core FEIS - 2008, Executive Summary, Figure ES-1

FIGURE 8-2 ARC PROJECT PREFERRED ALTERNATIVE



Source: New Jersey Transit/USDOT OIG Report – May 2010

According to the draft funding plan submitted by NJT to FTA in 2008 (presented in Table 8-1), the $8.7 billion costs for the ARC project would be shared three ways: $3 billion from the Port Authority of New York and New Jersey, $3 billion from the Federal Transit Administration Section 5309 New Starts Program, and $2.7 billion from New Jersey. The $2.7 billion New Jersey share would come from planned increases in New Jersey Turnpike Authority toll revenues ($1.25 billion), diversion of flexible federal CMAQ/NHS allocations ($1.3 billion), and Section 5307 American Recovery and Reinvestment Funds ($130 million). Most of the New Jersey share would come from funds normally used for bridge and highway repairs. New Jersey's 'special' transportation trust fund was not available as a funding source because its available revenues have been fully committed for debt service obligations to repay bonds. [1] The funding plan did not identify any source of funds for the $1.2 billion "Portal Bridge" replacement nor for any cost overruns. The funding contribution by the Port Authority and FTA was fixed at $3 billion each, so any cost overruns would be borne by New Jersey Transit, the project sponsor, and ultimately by the State of New Jersey.

In spite of the apparent weakness of the NJT 'Draft Financial Plan', the FTA approved an Early System Work Agreement in August 2009 for $1.35 billion in order to allow federal New Start funds and other funds to start flowing prior to the execution of the Final Funding Agreement which was contingent upon the submission by NJT of various project management documents including a satisfactory final financial plan and a risk management plan.

Although lacking a Final Funding Agreement for the full $3 billion FTA commitment and failing to gain approval of the project management plans, NJT awarded an initial contract to construct an underpass for the new two-track rail line at Tonnelle Avenue in North Bergen in June 2009 shortly after receiving FTA approval for final design and construction. A second contract was awarded in May 2010 for construction on the first of the three tunnel sections.

[1] http://www.state.nj.us/ttfa/faq/[2/28/2012 12:29:26 PM]

Table 8-1

Draft NJT Financial Plan (2008)		
Source of Funds	**Total Funds ($million)**	**Percent of Total**
Federal:		
Section 5309 New Starts	$3,000.00	34.5%
FHWA Flexible Funds (CMAQ/NHS)*	$1,319.98	15.2%
American Recovery and Reinvestment Act Section 5307 funds	$130.00	1.5%
State:		
Port Authority of New York and New Jersey	$3,000.00	
New Jersey Turnpike Authority	$1,250.00	34.5%
		14.4%
Total:	**$8,699.98**	100.0%

Source: USDOT Office of Inspector General Report – May 17, 2010

Coincidentally, around the time that the first construction contract was awarded, the USDOT Office of the Inspector General (OIG) initiated an audit of the ARC Project.[2] The purpose of the audit was to assure that the "FTA's ARC oversight activities provide reasonable assurance that significant cost, schedule, and funding risks have been identified and FTA has taken proactive steps to increase its oversight of ARC—as evidenced by requiring a project execution plan." The OIG issued a final report of its findings raising serious concerns about the ARC Project in May 2010, a month before the award of the second construction project by NJT.

The OIG report entitled, "*Actions Needed to Mitigate Risks Associated with the Access to the Core Project*", reached the following conclusions:

- "FTA lacks fully developed project documents from NJT that are key to identifying and mitigating risks."

[2] The FBI was conducting an active investigation of widespread bid rigging in New Jersey that led to the arrest of 44 individuals in July 2009. It is likely that the OIG audit was prompted, in part, by the ongoing FBI investigation of corruption.

- "FTA must also ensure that NJT addresses certain ARC funding resource challenges. ARC depends on several federal, state, and local funding sources, including $3 billion from the Port Authority of New York & New Jersey (Port Authority). As of January 2010, full Federal funding had yet to be approved, and the long-term availability of local funding was uncertain."
- "….the project's management controls are insufficient to detect fraud and ensure contractor integrity—in part because FTA did not request NJT to document its fraud prevention program in the project management plan…."
- "NJT opted not to use an independent private-sector inspector general (IPSIG) on the project—despite evidence that an IPSIG can help identify problems in real time, such as internal control weaknesses, contractor integrity and ethics lapses, and infiltration of organized crime."
- "Allowing ARC to proceed with an Early Systems Work Agreement without meeting all New Starts full funding grant agreement requirements adds to its inherent cost and schedule risks—heightening the need for FTA to effectively oversee NJT's management of the project."
- "FTA warned NJT that its assumptions for annual New Starts appropriations were significantly higher than Congress has historically given to any single transit project and exceeded levels FTA previously discussed with NJT."
- "FTA may not have sufficient commitment authority—the overall level of New Starts funding authorized by Congress—to execute a full funding grant agreement until a new surface transportation authorization law is enacted."
- "The long-term availability of local funding sources is also uncertain. FTA had concerns about the Port Authority's and Turnpike Authority's capacity to provide promised funding, totaling $4.25 billion, and delayed the financial capacity assessments for these funding sources."
- "FTA proceeded with an Early Systems Work Agreement without fully examining either Authority's ability to provide the promised funds—potentially jeopardizing the timely completion

of the project if the Port Authority or the Turnpike Authority cannot provide their share or cover any cost overruns."

The OIG Report, as evidenced by the excerpts presented above, was highly critical of FTA's oversight of the ARC project and, indirectly, raised serious questions about NJT's management controls, including financial and risk management. The report also questioned the level of commitment and adequacy of funding at the local level as well the FTA's authority to commit the balance of the New Start funds in the absence of a long-term transportation bill.

Subsequent to the 2010 OIG report, the $8.7 billion ARC project cost estimate, based on the draft funding plan submitted by NJT in 2008, had come under increased FTA scrutiny. FTA's independent cost estimates ranged between $11-14 billion, creating an unfunded shortfall of $2.3 to $5.3 billion. The revised costs were $6-9 billion higher than the original $5 billion cost estimate in 2004, rivaling the huge cost overruns experienced by the Boston Central Artery/Tunnel Project (aka "The Big Dig") which doubled in cost. Table 8-2 presents the history of estimated construction costs for the ARC project since 2004.

The ARC project received broad political support from both New Jersey and New York elected officials. New Jersey Governor Corzine, a Democrat, was a long-time proponent of the project and Senator Lautenberg, also a Democrat, worked hard to secure the $3 billion FTA New Start funds, one of the largest such grants in the nation. But the political winds had started to shift.

The Corzine administration was hit by a major scandal involving "bid rigging" in which 44 individuals, some of whom were Democratic public officials associated with the Corzine administration, were arrested by the FBI in the summer of 2009. Chris Christie, a Republican and former U.S. Attorney for the District of New Jersey, ran against Corzine and made ethics, fiscal responsibility, high unemployment, and high taxes major campaign issues. He promised that, if elected, he would not raise

the gasoline tax[3] – a potential source of additional revenues for the transportation trust fund and the ARC project.

Table 8-2
ARC Project Cost History

YEAR	Estimated Cost	Source of Cost Estimate
2004	$5 billion	http://www.nj.com/politics/index.ssf/2010/10/timeline_of_progress_in_hudson.html
2005	$6 billion	http://www.nj.com/politics/index.ssf/2010/10/timeline_of_progress_in_hudson.html
2006	$7 billion	http://www.nyctransitforums.com/index.php?page=hrtunnels)
2007	$7.4 billion	2007 DEIS
2008	$7.6 billion	FEIS Printing
2008	$8.7 billion	FEIS Distribution
2010	$11-14 billion	http://topics.nytimes.com/top/reference/timestopics/subjects/t/transhudson_passenger_rail_tunnel/index.html[2/27/2012 1:10:15 PM]

Note: Estimated costs do not include the $1.2 billion cost to replace the 'Portal Bridge'.

Chris Christie defeated Governor John Corzine in the November 2009 gubernatorial election and, shortly after coming into office in January 2010, issued Executive Order No. 14 in February 2010 declaring "…a state of fiscal emergency exists in New Jersey" due to a projected $2.2 billion budget deficit for FY2010. Although Governor Christie initially expressed support for the ARC project, that support had waned by the fall of 2010 when he ordered a halt to the project pending a 30 day review. Of particular concern was the continued cost escalation and rising funding shortfalls which would become the responsibility of the State of New Jersey. GOP officials also expressed concern that the ARC project was diverting scarce funds needed to repair bridges and highways. After failing to identify additional sources of funds to cover the overruns, Governor Christie terminated the ARC project in October 2010.

[3] New Jersey has one of the lowest combined excise fee/gasoline tax rates in the nation at 14.5 cents/gallon. By comparison the New York's gasoline excise tax is 25.8 cents/gallon and the Connecticut gasoline excise tax is 25.0 cents/gallon.
Source: http://www.taxadmin.org/fta/rate/mf.pdf

At the time the ARC project was terminated there were two active construction contracts underway and a third contract was about to be awarded. The $600 million that had already been spent would be wasted. There was widespread "shock" that the project was suddenly terminated and advocates of the project appealed to the governor to reconsider, but to no avail. FTA demanded the return of $271 million in federal funds expended for the ARC project but eventually settled for much less – only $95 million.

What happened to the $8.7 billion committed to the ARC project? The $3 billion FTA monies were lost and possibly diverted to other New Start projects elsewhere in the country, assuming FTA receives authorization to commit these funds. A portion of the Port Authority commitment, about $1.8 billion, was reprogrammed to fund four major reconstruction projects in New Jersey, including the 3.5 mile Pulaski Skyway spanning Newark Bay. The $1.5 billion in flexible CMAQ/NHS funds were, most likely, reprogrammed for bridge and highway repairs. In the end Governor Christie, a fiscal conservative, decided that it was more important to preserve the existing transportation system than to embark on a major system expansion project he felt New Jersey could not afford. The election cycle certainly played an important role in the fate of the ARC project, but it is unclear whether Governor Corzine, if re-elected, would have been able to find the monies to fund the huge cost overruns.

The ARC project, like the Nassau Expressway project, illustrates the difficulty of implementing mega-projects whose primary purpose is transportation system expansion, even when dedicated funds are available for that purpose, when the existing transportation system has significant unmet needs. The trade-in of Westway monies in 1986 was, in part, also motivated by the need to fix the existing transportation infrastructure.

In addition to a funding failure, the ARC project experienced a technical failure during the planning process because the cost estimate that formed the basis for selecting the preferred alternative and the issuance of a Record of Decision (authorizing final design and construction) was faulty. For complex

mega-projects, like the ARC, more engineering needs to be done during the planning stage in order to develop reliable costs and a better assessment of funding availability.

Flyvbjberg (2003) takes a more sinister view suggesting that project sponsors routinely understate the project costs in order to maintain support. He points out rail projects, especially those that involve tunneling, have a high risk of cost escalation and the risk is often hidden from public scrutiny until it is too late. Flyvbjberg notes, for example, that the Channel Tunnel between Great Britain and France had an 80 percent cost overrun and Boston's Central Artery project had a 196 percent cost overrun (Flyvbjerg 2003:14).

By comparison, the ARC project had a cost estimate of $7.6 billion when the FEIS was printed and an 8.7 billion cost when the FEIS was distributed in 2008. Following a review by the FTA, the cost estimate increased to at least $11 billion, but possibly much higher to $14 billion. Within a period of just two years, the cost increased 30-70 percent. When compared to the original cost estimate of only $5 billion in 2004, the cost escalated by 220-280 percent. Did the ARC project sponsors deliberately mislead the public regarding the true cost of the project or was the cost overrun simply due to engineering error?

Robert Moses (Caro 1974) followed a strategy of deception in securing funding for many of his projects. He made a habit of asking the Legislature for only a portion of the funds he really needed because he knew he would not get the funds if the full cost of the project was disclosed. Once construction was well underway, Moses would go back to the Legislature and ask for more money knowing that the Legislature would be too "embarrassed" to stop a project in the middle of construction and appear to waste taxpayer monies. It would be very bad publicity. Did NJT attempt to emulate Robert Moses when they started construction on the ARC project without having full funding commitments and with unreliable cost estimates?

Lessons Learned from the ARC Project:

- It is extremely important to develop reliable cost estimates as early as possible during the planning process – and before the Record of Decision authorizing final design and construction in order to assure that cost factors are properly considered in the selection of the preferred alternative.
- For complex mega-projects, sufficient engineering analysis should be performed during the planning stage to assure that cost estimates used to select the preferred alternative are reliable.
- Election cycles can have a profound effect on political support and funding commitments, especially for projects which take a long time to implement.
- Funding commitments need to be rock solid before starting construction; sufficient long-term revenues need to be identified and earmarked to support that commitment.
- Some cost overruns are to be expected. The funding plan should allow for that contingency.

Chapter 9 – JFK AirTrain Project (previously JFK Light Rail System)

The $1.9 billion[1] John F. Kennedy (JFK) Airport AirTrain Project, completed in 2004, was one of the first successfully implemented transportation mega-project in the post Robert Moses era in the New York City area. The AirTrain Project provides intra-airport circulation between the terminals, Federal Circle and the long-term parking lots. A four mile extension of the system to the north, along the median of the Van Wyck Expressway, connects with the LIRR Jamaica station in Queens, the Archer Avenue subway line, and various bus lines at Parsons Boulevard. In addition, the AirTrain system connects to the Howard Beach subway station (served by the "A" train) which is located at the western periphery of JFK Airport. See Figure 9-1 and Figure 9-2..

The AirTrain Project follows in the wake of 21 previous unsuccessful proposals/plans for improving public transportation access to JFK International Airport since the 1960's. [2] An analysis of why the AirTrain project succeeded while the previous 21 attempts failed offers an opportunity to better understand why mega-projects (often) fail.

Previous Airport Access Improvement Plans/Proposals (partial list)

1. In 1969, the MTA proposed a connection from the LIRR Jamaica Station to JFK via Baisely Boulevard, a mostly residential street fronting Baisely Pond Park. This proposal was met by strong community opposition and dropped from further consideration.

2. In 1969 the PANYNJ, the MTA, and the airlines recommended an alternative extension of the LIRR to JFK via the abandoned Rockaway Beach Branch to Howard Beach and then to the Central Terminal Area where passengers would transfer to a proposed people-mover system. The MTA developed preliminary plans for the reactivation of the Rockaway Beach Line. Residents of Forrest Park objected vigorously to reactivating the abandoned rail line which abutted private

[1] 2004 cost
[2] PANYNJ Light Rail System FEIS – May 1997

homes. Residents were concerned about noise, vibration, and the loss of privacy. Queens elected officials came out strongly against the project.

3. In 1977, the PANYNJ again proposed using the abandoned Rockaway Line right-of-way, but this time for a bus rapid transit system. This concept was attractive, operationally, because it would have offered a one-seat ride from Manhattan directly to the JFK airport terminals. Stations in south Jamaica were later added to the plan in the hope of making it more palatable. But the local community rejected the plan on the same grounds as the previous rail proposal – noise, vibration, loss of privacy. In addition, residents raised concerns about diesel fumes adjacent to their properties. The community and Queens elected officials were strongly opposed to this plan.

4. In 1978, the MTA/NYCTA initiated the "Train to the Plane" express subway service from Penn Station to the Howard Beach subway station where air passengers transferred to waiting shuttle buses to reach the terminal areas. This premium service had fewer stops and was slightly faster than the regular "A" train service to the Howard Beach subway station. There was no community opposition to this service since it used existing active subway rights-of-way. The express service used reconfigured subway cars with luggage racks. Security was maintained by onboard Transit Police. The service was eventually discontinued in 1990 due to low ridership and operational conflicts with regular subway service. However, the shuttle buses from the Howard Beach subway station to the terminal areas remained in service, allowing regular "A" train passengers to get to JFK Airport. The "Train to the Plane" (although not a mega-project) was not successful because it failed to provide adequate service to airport customers and employees.

5. In 1993, the Port Authority presented an ambitious 22-mile (self-operating) Automatic Guideway Transit (AGT) system proposal providing service to Laguardia Airport and JFK Airport from a proposed new east side terminal at 48th Street and 3rd Avenue via the Queensboro Bridge. The terminal at 48th Street and 3rd Avenue was of particular concern since it did not interface with any existing subway (or railroad) station, raising fears that most passengers would access the new airport service via cars or taxis which would exacerbate already congested conditions during the peak hours. Three community boards in Manhattan opposed the project. The plan was rejected due to rising costs, environmental impacts, and community opposition.

With the exception of the "Train to the Plane", the various PANYNJ plans to improve public transportation access to JFK (and LaGuardia) Airport conflicted with existing uses along the proposed alignment which led to community opposition and political opposition.

In 1995, the Port Authority presented a scaled down, 8.4 mile long, lower-cost version of the original AGT plan, called the JFK "Light Rail System" (LRS)[3], providing service between the LIRR Jamaica Station and JFK Airport. The new plan gave priority to improving access to JFK Airport because it had a greater growth potential than LaGuardia Airport (according to one interviewee).[4] It also avoided the need to build a new controversial terminal in Manhattan at 48th Street and 3rd Avenue, opposed by three community boards, since nearly all LIRR trains to and from Penn station stop at Jamaica Station. And this smaller scale mega-project was potentially affordable.

The alignment of the LRS was almost entirely along existing public rights-of-way currently in active use for transportation purposes. Half of the length of the LRS was within JFK Airport and did not

[3] Later renamed the AirTrain

[4] A follow-up study by the Port Authority looked at the feasibility of extending the Astoria Line (the 'N' train) to LaGuardia Airport, but this plan proved to be not viable.

present any potential conflicts with the community. Most of the other half, about 4 miles long, was sited within the median area of the Van Wyck Expressway (I-678), a heavily traveled corridor with over 160,000 vehicles daily that is owned by the New York State Department of Transportation. A smaller segment, crossing over the Belt Parkway, is owned by the City of New York. There were only three private commercial properties, near Jamaica Station, that were needed for the LRS project.

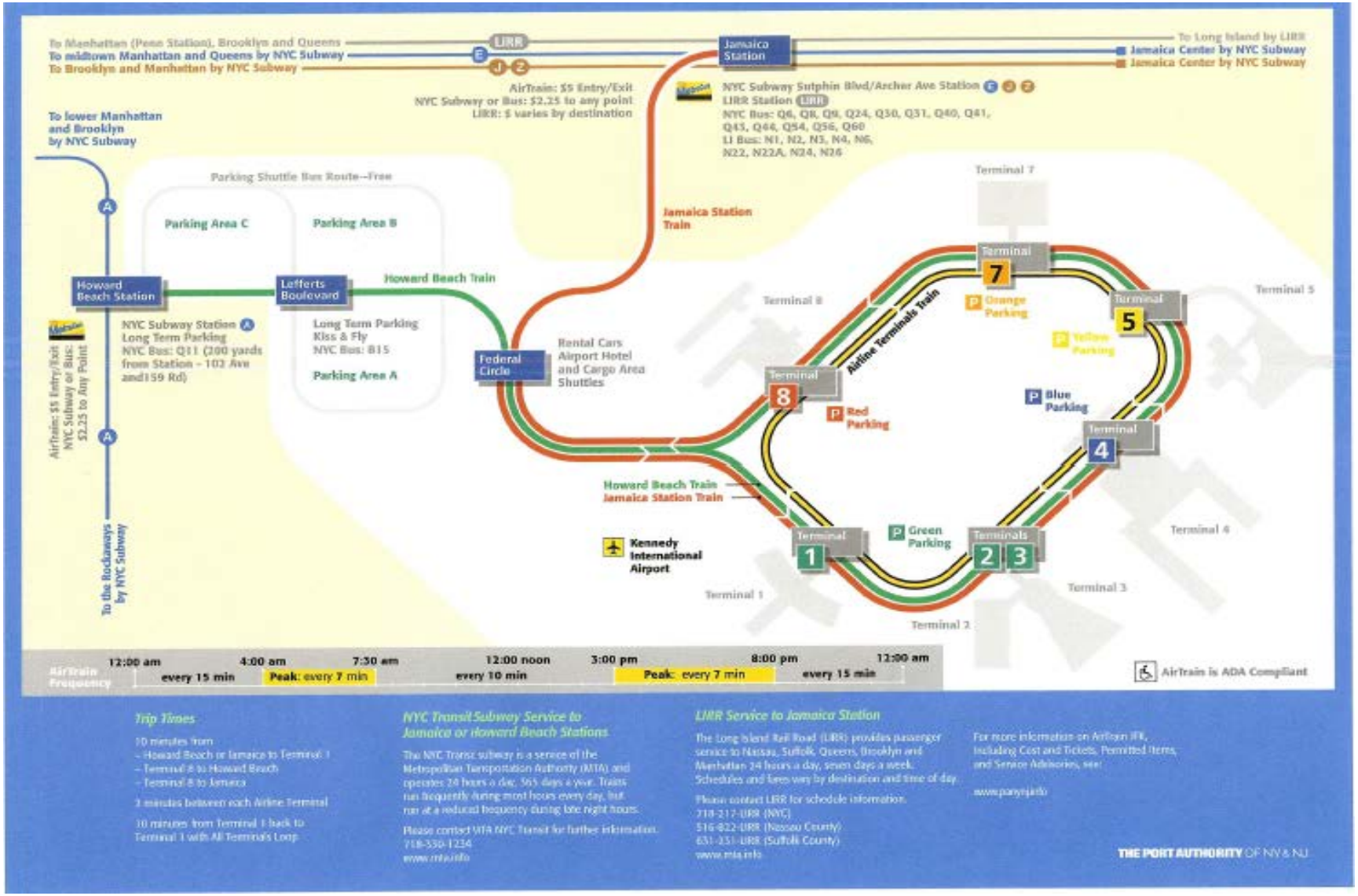
While the availability of publicly owned right-of-way was very promising, early critics of the LRS project pointed out that it did not offer a "one-seat" ride from Manhattan to JFK Airport as the plan required a transfer at Jamaica Station.[5] There was also concern that the guideway and LRS equipment was incompatible with the standard gauge rail used by the LIRR and MTA and it would preclude the possibility of a one-seat ride in the future. Others questioned whether a system without an onboard operator would be a safe environment for passengers. Some critics, pointing to the failure of the "Train to the Plane" service, questioned whether the proposed service would meet the needs of airport passengers and employees.

The community expressed concerns about traffic impacts during construction. Homeowners abutting the service roads and along cross streets were concerned about vibration (during pile driving for the pier foundations) and potential damage to their houses. Others were concerned about visual impacts of an elevated guideway 40 feet above the depressed Van Wyck Expressway and about 20 feet above the level of the adjacent service roads. Some residents were concerned about screeching track noise and bright train lights in the middle of the night disturbing their sleep.

[5] An interviewee said that the transfer at Jamaica Station was not a problem because New Yorkers are generally accepting of transfers.

FIGURE 9-1
AIRTRAIN/LRS ALIGNMENT

FIGURE 9-2: JFK AIRTRAIN STATIONS (Source: PANYNJ AirTrain Brochure)



The PANYNJ, recognizing that community opposition was one of the main causes for failure to implement many of the previous airport access plans, decided to pay special attention to the community's concerns. The PANYNJ project team met with the community on a regular basis and eventually gained their trust. Traffic management plans were developed that minimized diversions onto local streets. A traffic command center was established to monitor traffic conditions, clear traffic incidents, and provide motorist information. Lane closures along the VWE were restricted to off-peak and nighttime periods. At the community's request, traffic control agents were placed strategically at critical locations. Landscaping and streetscaping were made an integral part of the plans. An engineering team surveyed residents' home (with their consent) to provide a baseline for pre-construction conditions. A special fund was established to reimburse homeowners promptly in the event of a claim for damages (within certain limits). A community project office and a 24-hour hotline were set up to insure ready access to project related information and to address issues in a timely manner.

In order to alleviate fears about excessive track noise, the PANYNJ sponsored a paid trip to Seattle for a number of community representatives to visit a similar system in operation. The Seattle system was nearly silent and the community representatives were amazed (according to one interviewee). When the community representatives returned home from Seattle, they were able to share their experiences with other members of the community and the noise issue went away. This is an example of not relying on assertions alone to convince an apprehensive community that there will not be any adverse impacts. The PANYNJ took extraordinary measures to help the community discover the facts for themselves by providing opportunities and the necessary visualization tools to better understand what the future would look like and to help manage the change to that new future.

The lack of a one-seat ride remained a critical issue. In response, the PANYNJ agreed to contribute $100 million at Jamaica Station to improve pedestrian circulation and ease of transfer

between LIRR trains and the new LRS system on the south side. This work was part of MTA's nearly $400 million LIRR Jamaica Station rehabilitation and modernization program. At the Howard Beach subway station, the PANYNJ built a new pedestrian overpass to facilitate a smooth transfer to the LRS at a cost of about $10 million as part of the MTA/NYCTA Howard Beach subway station modernization which included improved handicapped access. Because the scope of the LRS project was expanded to include features that would directly benefit the community, the project was viewed more positively and initial community opposition and skepticism was effectively transformed into community support. The (financial) partnerships formed with the NYSDOT, MTA, LIRR, and NYCTA helped to foster agency cooperation and support at the state and local level.

The PANYNJ needed considerable agency support and cooperation at the federal, state, and city levels to obtain approval of the EIS for the LRS project. The EIS, begun in 1994[6], required approvals from the Federal Aviation Administration (FAA) and NYSDOT, acting as joint co-lead agencies. Right-of-way needed to be acquired voluntarily from three different public agencies (MTA/LIRR, NYSDOT, and NYCDOT) since the PANYNJ cannot initiate condemnation proceedings over State-owned or City-owned properties.[7] A significant portion of the LRS alignment was in the median of an interstate highway and construction of the LRS footings and columns were situated (very) close to existing state-owned bridges spanning the VWE. Therefore, NYSDOT had a significant review and oversight role during all stages of the implementation process including the EIS phase, final design, and construction. New York City, through its application of the Uniform Land Use Review Process (and the granting of an easement for a section of the LRS), was able to exercise considerable control over the project. Finally, the LRS project required a separate "Work Permit" from both NYSDOT and NYCDOT for construction since both agencies

[6] A Draft EIS was issued in 1994; A Written Reevaluation was prepared in 1996; and an FEIS was issued in 1997.
[7] According to one interviewee, the PANYNJ chose not to condemn private properties. Instead, the PANYNJ made generous offers to induce property owners to sell.

claimed jurisdiction over the Van Wyck Expressway. The construction permits could be revoked immediately by either the State or City for failure to comply with the permit conditions.

The PANYNJ built a solid working relationship with all stakeholder agencies. One interviewee described the agency coordination process for the LRS project as one of the "finest example of governmental agencies working together…"

The cooperation of State review agencies (NYSDOT, DEC, SHPO) was facilitated by the strong executive support and leadership of Governor Mario Cuomo. NYSDOT, the co-lead agency for the EIS, expended considerable staff resources to review the EIS and the voluminous back-up materials. The design plans also required careful NYSDOT review to ensure that design standards and safety were not compromised along a critical interstate route. In order to expedite the review process, NYSDOT and the PANYNJ entered into an inter-agency agreement that defined their respective roles and responsibilities vis-à-vis the LRS project. The agreement provided for a full-time NYSDOT project manager responsible for coordinating all NYSDOT reviews and approvals and liaison with the PANYNJ project team. PANYNJ agreed to reimburse NYSDOT fully for the time its project manager and other staff spent on the LRS project and, in turn, NYSDOT agreed to review and comment on all LRS project submissions within 30 days.

A second agreement was entered into by NYSDOT and the PANYNJ that added about $40 million of NYSDOT bridge and highway work on the capital program, including operational and safety improvements, to the LRS contract, to be funded by NYSDOT, in order to coordinate all work along the VWE and minimize traffic impacts. The coordination of the LRS project and the NYSDOT projects reduced the cost of the bridge and highway work since the contractor was already mobilized and the maintenance and protection of traffic (MPT) was already in place for the LRS project. More importantly, if the bridge and highway work had not been coordinated with the LRS contract, a subsequent NYSDOT

contract would have "ripped up" some of the new lighting, drainage, and landscaping along the VWE constructed previously under the LRS contract. This would have been a tremendous, and unnecessary, waste of public resources. The coordination of the PANYNJ and NYSDOT projects along the VWE corridor was received positively by the local community and elected officials. It reassured stakeholders that governmental agencies were coordinating with each other and working effectively for the benefit of the public.

While the LRS project enjoyed the strong support of State elected officials and State agencies, New York City did not initially support the project. One interviewee stated that Mayor Guiliani was opposed to the LRS project because he was seeking to replace the PANYNJ with another operator for the City-owned JFK Airport. The City asserted that the terms of the lease were unfair because the lease payments by PANYNJ were too low. The lease dispute threatened to derail the LRS project as the City seemed to hold the LRS project hostage. Eventually, the City and the PANYNJ renegotiated the JFK Airport (and LaGuardia) leases under more favorable terms and the City gave its tacit support for the LRS project – possibly as a 'quid pro quo'. The lease dispute between the City and the PANYNJ illustrates the use of power by the City, by its ability to withhold approval of virtually any mega-project regardless of its merits, in order to achieve unrelated objectives. The actions by the City to extract "benefits" in exchange for its approval of the LRS project are a classic example of "rent-seeking" behavior.

Mega-projects, due their high importance to the project sponsor, offer significant opportunities for "rent-seeking" by organizations or agencies with the ability to stop or delay the project. Rent-seeking activities can and do add significant costs to mega-projects, sometimes to the point where these projects become economically not viable or not fundable.

Funding

The LRS project was funded through the Passenger Facility Charge (PFC), a program that "…..allows the collection of PFC fees up to $4.50 for every enplaned passenger at commercial airports controlled by public agencies. Airports use these fees to fund FAA-approved projects that enhance safety, security, or capacity; reduce noise; or increase air carrier competition."[8]

When the FAA issued the Record of Decision in 1997 approving the LRS (AirTrain) project, the use of PFC funds was also approved. The PFC funding source was dedicated and reliable since it was not subject to annual appropriations by any governmental body. These funds were also outside of the control of state and local agencies (other than the PANYNJ) as stipulated in the Passenger Facility Fees Act –49 U.S.C. Sec. 40117, Subsection (j):

"A State, political subdivision of a State, or authority of a State or political subdivision that is not the eligible agency may not tax, regulate, or prohibit or otherwise attempt to control in any manner, the imposition or collection of a passenger facility fee or the use of the revenue from the passenger facility fee."

A key to the success of the AirTrain/LRS project was that funding approval occurred at the conclusion of the planning process, in 1997, when the EIS was completed and a Record of Decision was issued and, once the funding approval was granted, it was protected by federal law from being diverted for other uses by state and local jurisdictions or authorities.[9]

Lessons learned

- Community opposition is the primary reason why previous attempts to improve public transportation access to JFK Airport failed.

[8] http://www.faa.gov/airports/pfc/

[9] The Passenger Facility Act could be amended, and potentially weakened, at the federal level since 'government can always change its mind."

- The AirTrain/LRS community participation program and measures taken by the PANYNJ project team to gain trust were highly effective. This led to community acceptance of the AirTrain/LRS project.
- Executive support from the governor was instrumental in getting state agencies to work cooperatively; the AirTrain/LRS project benefited from a close working relationship among state agencies.
- Mega-projects attract rent-seeking activities which can stop or delay its progress and raise costs.
- The availability of dedicated funds, not subject to annual appropriations or diversion to other uses, was critical to the successful implementation of the AirTrain/LRS project.

Chapter 10 – Analysis of Why Transportation Mega-Projects (Often) Fail

Implementation Failure

Five major causes of mega-project implementation failure (as well as non-mega project failure) have been identified: 1) lack of funding, 2) community opposition, 3) political opposition, 4) unresolved agency conflicts, and 5) technical failure. Table 10-1 presents a summary of the implementation issues for the five mega-projects evaluated. The Nassau Expressway and the Westway projects are both highway expansion projects, but Westway includes a massive development component along the west side of Manhattan. The Kosciuszko Bridge Replacement is a large highway bridge infrastructure renewal project. The ARC and AirTrain projects are both transit expansion mega-projects.

Only one of the five case study mega-projects, the JFK AirTrain project, was implemented successfully by the criteria set forth in the introduction of this thesis because the planning process produced a successful mega-project plan that was approved, designed, and constructed. And upon completion of the AirTrain project, it performed in accordance with the expectations that formed the underlying basis for approval.

A second mega-project, the Kosciuszko Bridge Replacement, has a potential of being eventually implemented if funding can be identified since there is a compelling need for the project. The remaining three case studies (Westway, Nassau Expressway, and Access to the Region's Core) are considered to be failed mega-projects since these projects were not implemented. Westway is history but, theoretically, the Nassau Expressway and the ARC projects could be revived in some mutated form in the future if funding becomes available.

The cause of project implementation failure is often complex with multiple causative factors interacting dynamically. For instance, political opposition to the Westway project was, at least in part, the result of community opposition. Once political opposition developed, elected officials advocated for changing the federal legislation to allow the funding for Westway to be traded in. Once the legislation

was changed, the competition for the funds and a deadline for trading in the funds led, ultimately, to a funding failure. The primary cause of the Westway project failure was community opposition which triggered secondary project failure mechanisms, namely political opposition and loss in funding. The cause of community opposition can be partially attributed to a technical failure of the planning process and the (initial) inflexibility of the Interstate funding mechanism – which also made funding both a primary and secondary cause of implementation failure because the funding restrictions did not allow modification of the design standards (of an Interstate highway) to accommodate local needs.

The failure of the Nassau Expressway implementation is straightforward – simply a lack of funding. This project did not have a dedicated funding source and, therefore, it competed unsuccessfully with higher priority infrastructure renewal projects. Political support from Nassau County officials was relatively strong, but not sufficient to overcome a lack of interest and different priorities in New York City. A separate dedicated fund would need to be established specifically for highway system expansion so that these types of projects do not have to compete with infrastructure renewal funds. But it would be bad public policy to expand the transportation system while the existing system continues to deteriorate due to a lack of funds. Adequate funding would need to be provided for both infrastructure renewal projects and system expansion projects.

Lack of adequate funding was also the main reason why the ARC project failed to be implemented, but the failure pattern is more complex. Governor Christie initially supported the project until he learned that the cost estimates were too low and there was a high risk of cost overruns that New Jersey would be responsible for. Ultimately, the Governor determined that New Jersey could not afford to divert funds from critical highway infrastructure needs to fund a project whose costs were out of control. But the funding failure was triggered by a technical failure to assess risks and to estimate costs accurately or perhaps the cost was "low-balled" to maintain support for the project. If the true costs of the project were known early, perhaps the project could have been scaled back or built in phases with independent utility – or perhaps another preferred alternative would have been selected altogether. The technical

failure to estimate costs accurately led to a disparity between project costs and available funding resources – which led to a funding failure since there was not sufficient political support to allocate additional funds to cover the huge overruns.

Funding is a common theme for all of the five mega-project case studies presented. In two instances, the Nassau Expressway and the Kosciuszko Bridge, the lack of funds was the direct cause of implementation failure since these two projects completed the environmental study phase successfully and received approvals to proceed to final design and construction, but no funds or insufficient funds were allocated to allow full implementation. The Westway project had sufficient funding commitments to allow full implementation, but the monies were lost (traded-in) due to community and political opposition. The ARC project also had funding commitments to cover the estimated $8.7 billion in construction costs (in the approved 2008 FEIS), but the high cost overruns led to a reevaluation of the project in 2010 and the subsequent loss of political and financial support.

The JFK AirTrain project is unique among the five case studies presented (besides being the only successful mega-project) because a dedicated funding source was available (PFC funds) specifically for airport related improvements and, by statute, these funds could not be diverted by state and local officials for other uses. It was the 'protection' of these funds from competition and potential diversion to other purposes that created a stable and reliable long-term funding mechanism – a prerequisite for successful mega-project implementation because these projects typically take many years to implement.

TABLE 10-1
SUMMARY OF PROJECT IMPLEMENTATION ISSUES

PROJECT IMPLEMENTATION FAILURE CATEGORY Type of Project	Nassau Expressway Highway Expansion	Westway Highway Expansion	Kosciuszko Bridge Bridge Replacement	ARC Commuter Rail Expansion	JFK AirTrain Transit (light rail) Expansion
1. FUNDING					
a. Lack of adequate funding					
b. Poor cost estimates; lack of contingencies for cost overruns					
c. Lack of adequate funding/staff resources for timely agency reviews					
2. COMMUNITY OPPOSITION					
a. Lack of compelling need					
b. Ineffective communication of the problems and needs to be addressed project impacts, and effectiveness of mitigation measures					
c. Lack of community trust					
d. Unmitigated impacts					
e. Lack of perceived benefits to the community					
f. Potential for higher taxes/user fees					
g. Community relations/communication issues					
3. AGENCY OPPOSITION					
a. Unresolved institutional conflicts (laws, regulations, policies)					
b. Service impacts on agency operations					
c. Fiscal impacts on agency operations					
4. POLITICAL OPPOSITION					
a. Fiscal policies and priorities					
b. Electability/loss or gain of political capital					
5. TECHNICAL FAILURE					
a. Lack of effective project management and oversight					
b. Engineering design flaws					
c. Cost reliability issues					
d. Schedule reliability issues					
e. Lack of adequate internal controls					

Essential Characteristics of a Successful Mega-Project

Figure 10-1 shows a simplified project implementation flow diagram and the key elements of successful mega-project implementation. Surprisingly, successful mega-project implementation requires only two essential elements: adequate funds and agency approvals. But funding is obtained through the political process, so political support is essential - especially executive political support. The calculus used by elected officials to support, oppose, or remain neutral with respect to a specific project is complex and beyond the scope of this thesis. However, the factors that generally influence their positions include, but not limited to, impacts of the project on the local community, economic development, effects on the environment, and last but not least – electability.

In general, mega-projects must demonstrate a 'compelling need' in order to compete effectively for funds in the political arena and to maintain public support. The need for the project must be communicated effectively by the project team in order to build and maintain sustainable partnerships over a long period of time.

Finally, project impacts must be minimized and/or mitigated to the maximum practicable extent possible to secure agency approvals and gain community acceptance. The failure to mitigate project impacts, even within reviewing agency guidelines, will generate community opposition and potential loss of political support and funding.

The Role of Local Community Groups in New York City

Local community groups, especially in New York City, play an important role in mega-project implementation through their ability to mobilize and voice opposition. Local communities must weigh the need for the project (which should be compelling) with anticipated local impacts and the effectiveness of measures to mitigate impacts. Most mega-projects have at least some unavoidable impacts, especially

during construction and, therefore, enhancements are frequently offered to the community (or negotiated) to help offset the years of inconvenience during construction.

While local community groups in New York City do not approve or reject a transportation mega-project, their substantial influence upon local elected officials can create a loss of political support that can lead to either a catastrophic loss of funding (e.g. Westway) or the withholding of critical agency approvals or permits (PANYNJ airport access proposals). Many of the 21 previously failed attempts by the PANYNJ to improve transit access to LaGuardia and JFK airports failed because of strong community opposition that led to political opposition. Although the PANYNJ had a secure source of funds, and the funds were never in jeopardy due to local political opposition, the Mayor of New York City had executive power to direct NYC agencies to withhold the necessary permits and approvals for construction. The PANYNJ knew that it was unwise to attempt to implement a project that the local community and elected officials vehemently opposed because they would not get the necessary local agency approvals. But the 22nd attempt, the JFK AirTrain project, was finally successful.

In New York City, it is very difficult to implement a mega-project that is opposed by the local community. Therefore, community groups are in a strong negotiating position and project sponsors make every effort to make local community groups 'happy' (e.g. JFK AirTrain) or at least neutral (e.g. Kosciuszko Bridge Replacement and Nassau Expressway) by mitigating impacts to the maximum extent possible and offering the community enhancements such as park space and park equipment, landscaping, streetscape, etc. In some cases, community enhancements in the guise of 'mitigation' can increase project costs significantly.

The Role of Business and Special Interest Groups

Business and special interest groups consist of a wide variety of groups that have a narrow focus on economic development, jobs (unions), real estate, business activity, environmental issues, promoting transit, promoting auto travel (AAA), etc. These disparate groups attempt to influence elected officials for or against a particular mega-project. In general mega-projects must maximize the benefit and minimize

the harm in order to gain general support from business and special interest groups. Support from these groups can help to maintain crucial political support as well as funding (e.g. Boston Central Artery/Tunnel Project).

The Boston Central Artery/Tunnel project had strong sustained support from the downtown business community for nearly two decades. That support was so strong, in fact, that several gubernatorial candidates who ran for office opposing the project quickly changed their minds after they took office (Altschuler and Luberoff, 2003). It was quite remarkable that the Boston Central Artery/Tunnel project was able to maintain both federal and local funding commitments for such a long time under different administrations. Such sustained political support and funding commitments is not typical of mega-projects.

Agency Approvals

Mega-projects in the New York City metropolitan area using federal funds generally must obtain approvals and/or permits at all three levels of government – federal, state, and local. The types of permits and approvals required vary by specific project type and its impacts. It is not unusual for a transportation mega-project to require as many 15-20 separate permits and approvals. The agency review is the mechanism by which institutional conflicts are resolved, usually by modifying the plans, in order to conform to the reviewing agency's requirements. A number of interviewees have cited a problem with the timeliness of some agency reviews even for high priority projects. It was noted that sometimes months pass before a reviewing agency responds to a submittal. Several interviewees suggested that reviewing agencies should be required to respond within 30 days to a submission.

In general, most project sponsors are now familiar with review agency requirements and project scopes are carefully calibrated accordingly to minimize adverse impacts and gain agency (and community) approvals. Only the Westway project had difficulty in obtaining agency approvals because of the significant unmitigated impacts and the controversy surrounding the project. Project selection criteria

take into account the project impacts and the implementation feasibility (a code word for agency approvals).

In summary, based on the five case studies and related projects considered, the major obstacle to the implementation of transportation mega-projects in the New York City metropolitan area is the general lack of funding for both infrastructure renewal and system expansion. A second threat to mega-project implementation is community opposition that can lead to loss of political support followed by a catastrophic loss of funding and/or the withholding of critical agency permits and approvals.

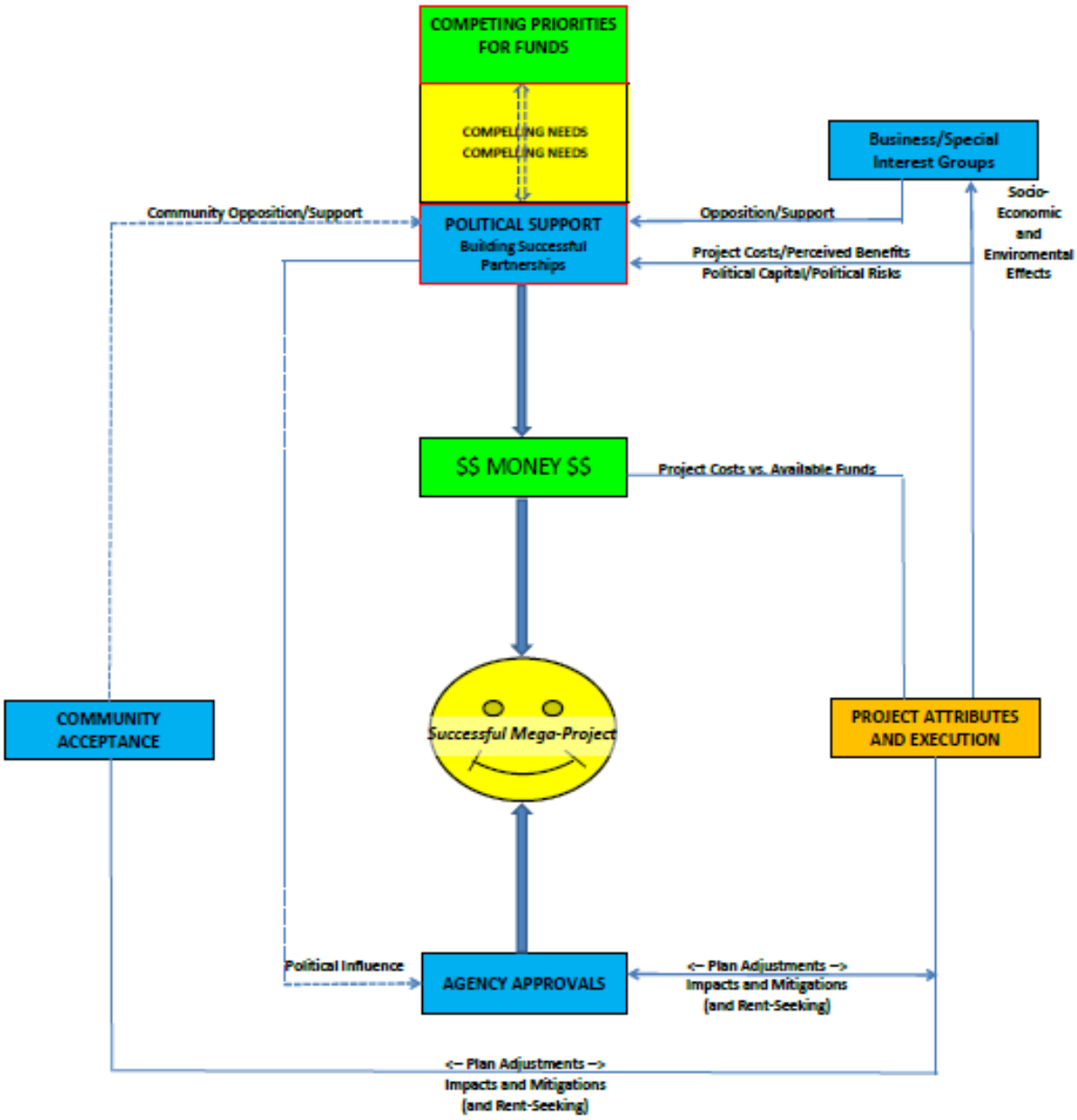
Another major obstacle to the implementation of mega-projects is the long (and painful) planning and environmental review process which make it difficult to sustain political support and funding commitments over an extended period of time (e.g. ARC). The underlying problem, in part, appears to be a lack of system planning at the regional level and a lack of a vision of what the future transportation system should look like. (Lapp and Munoz-Raskin, 2007) As a result, individual mega-projects are burdened with the task of performing time consuming systems planning and major investment studies that would not be required if there was a transportation plan already in place. On the other hand, it is difficult to do the systems planning at a regional level when there are no funds available and no long term funding commitments to implement any of the transportation improvements that may be contained in the plan. In the absence of funding, such a plan would be wishful thinking and sponsoring agencies would be averse to raising public expectations.

Lapp and Munoz-Raskin (2007) suggest empowering the New York Metropolitan Transportation Council (NYMTC), the MPO, to do the regional planning and policy planning that they are mandated to perform but lack the required institutional support to fulfill their role effectively. They note that plans are developed based on an agglomeration of projects advanced by individual member agencies instead of projects being derived from a regional plan. The lack of regional planning is a significant obstacle to mega-project implementation. However, it may be a challenge for NYMTC member agencies to yield autonomy to the MPO and lose the ability to set its own priorities. Perhaps a new agency, an authority or

a public benefit corporation somewhat removed from the daily political arena, could work in concert with the MPO and member agencies to develop a regional transportation plan that would lead to a unified vision of the future and the basis for the development of mega-projects.

A key question, what comes first: funding or comprehensive regional planning? The answer is probably both. Without a vision of the future, it is difficult to get long term funding commitments and without the possibility of funding it is difficult to imagine a different future. Funding and regional planning must happen at the same time.

Figure 10-1
Project Implementation Flow Chart



Chapter 11 – The Funding Dilemma

The Use and Misuse of Dedicated Transportation Funds

Funding was identified in Chapter 10 as one of the main reasons why mega-projects (often) fail, even for those that have successfully completed the planning and environmental review phases. But the funding problem is not confined to mega-projects. It is national and statewide in scope affecting the viability of the entire transportation system.

New York State's ability to fund its transportation needs continued to deteriorate as general revenues and gasoline excise tax collections declined during the Great Recession of 2008-2010. In a November 17, 2010 'Report to the Governor on New York State's Transportation Infrastructure', Lt. Governor Richard Ravitch summarized the dire funding situation in New York State as follows:

"New York State currently lacks the revenues necessary to maintain its transportation system in a state of good repair, and the State has no credible strategy for meeting future needs. Simply maintaining the State's existing physical assets will take billions of dollars annually. Expansion of the transportation network to facilitate economic growth, meet population increases, and improve quality of life will take billions more. But the resources required to cover these needs are in short supply. In part, the lack of adequate funds is due to the current recession, declining State revenues, and federal funding uncertainty. But it also reflects the fact that New York has long failed to secure enough revenues to meet both the operating expenses and the capital requirements of its transportation system."

The state's finances have continued to deteriorate and transportation funding has been reduced significantly. Based on conversations with several (anonymous) individuals at NYSDOT, the capital program has been reduced to a bare minimum in both the New York City Region and the Long Island Region. Only 'essential' projects are being advanced to preserve the existing transportation system and to address safety issues. There are few infrastructure renewal projects in the current two year program.

There has been an increasing reliance on emergency repairs to stabilize the condition of bridges and highways in order to prevent unsafe conditions or unscheduled closings.

The Ravitch report to the Governor recommended issuing bonds to provide the necessary funds for transportation improvements. The report was widely criticized for advocating increased borrowing, and adding to the State's large debt, instead of recommending viable long-term solutions to a structurally flawed funding mechanism.

New York's transportation funding mechanism was not always flawed. In 1991, the New York State Legislature established a dedicated fund, called the 'State Dedicated Highway and Bridge Trust Fund' (SDF), using revenues from highway taxes, vehicle taxes and fees, petroleum business taxes and a number of smaller resources. According to Governor Mario Cuomo's approval memorandum, the purpose of the SDF is to provide a "…reliable, predictable stream of revenues [that] will allow … for the orderly development and management of transportation programs and projects, without reliance on periodic bond issues."

The original 1991 SDF legislation was intended to establish a secure funding source to provide a dedicated 'pay-as-you-go' funding mechanism. The SDF was commonly touted as the "lock box" because the funds were believed to be protected from pilferage. But only two years later, in 1993, the State weakened its commitment to a pay-as-you-go funding mechanism. The act was amended to allow the SDF monies in the "lock-box" to be used for debt service payments to cover the issuance of bonds, a clear deviation from the fund's intended purpose. The SDF legislation was further amended in 2001 to allow use of the funds for Department of Motor Vehicle expenses and NYSDOT snow and ice removal, expenses normally covered by the state operating budget. The two amendments significantly weakened and transformed the intent of the original SDF legislation. By FY2008/09, only 27.2 percent of SDF expenditures were available for transportation capital projects, while 30.2 percent was spent for debt

service and 47.2 percent was spent on 'state operations'.[1] Nearly three quarters of the FY2008/09 SDF monies were used for expenditures other than the intended purpose of the original legislation that created the fund.

New Jersey's transportation funding situation is even worse as described in a report by the Regional Plan Association.[2]

"…..Over the course of the last 25 years, however, the focus of the [New Jersey Transportation] Trust Fund as a funding mechanism has shifted from primarily pay-as-you-go financing to a heavy reliance on first short-term (10-year), and now long-term bonds (20-year, and since 2006, 30-year). Trust Fund monies, originally intended to support capital improvements, have also increasingly been used to fund maintenance costs once considered part of the operating budget paid for out of the state's general fund. Finally, the Trust Fund's overall annual spending in Capital Program contributions and debt service payments have grown more than twice as fast as the tax and fee revenues dedicated to the Trust Fund. The bonds issued to cover the gaps commit the Trust Fund to higher annual debt payments, further increasing the Trust Fund's expenses. This is the spiral of debt from which New Jersey now has to break free."

According to the RPA report, over the past two decades substantial funds from the Trust Fund, over $360 million a year, have been diverted to pay an increasing portion of the New Jersey Department of Transportation and New Jersey Transit maintenance and operating costs. The diversion of funds to other uses and increasing use of the funds for debt service, a practice similar to New York, has undermined the viability of the Trust Fund.

[1] Source: Thomas P. DiNapoli, State Comptroller, "The Dedicated State Highway and Bridge Trust Fund: Where Did the Money Go?" , Office of the State Comptroller, October 2009

[2] "Spiral of Debt: The Unsustainable Structure of New Jersey's Transportation Trust Fund", Regional Plan Association, March 2010

At present, the Trust Fund can no longer be used to fund transportation capital projects since existing dedicated revenues are only sufficient to cover debt service payments, a situation that is expected to continue for the next three decades unless the fund receives a substantial infusion of new revenues. In essence, the Trust Fund is completely broke.

It can be argued that the failure of the ARC project can be attributed, in part, to the lack of resources in the Trust Fund to cover the ongoing capital program which prompted Governor Christie to divert the funds committed to the ARC project to address the poor condition of New Jersey's highways and bridges which are considered to be among the worst in the nation.

The diversion of funds from the [New York] SDF and the [New Jersey] Trust Fund illustrates the 'Funding Dilemma' - the inability of government "to make a commitment because it always has the possibility of changing its mind, and earlier 'agreements' cannot be enforced" (Stiglitz 2010:10).

Restoring the Health of the [New York] SDF and [New Jersey] Trust Fund

A first step in resolving the funding problem is to restore the integrity of the New York SDF "lock-box" by revoking the two amendments that undermined its original intent. But, in addition, there needs to be a mechanism that protects the SDF by increasing the institutional transaction costs of any future legislative action (Stiglitz 2010: 10) that would undermine the purpose and use of these funds. This can be accomplished, perhaps, by an amendment to the state constitution that would restore the SDF to its intended purpose and earmark sufficient revenues to fund essential transportation improvements. The revenue stream should be indexed for inflation and the funds should be restored to a pay-as-you-go funding mechanism as originally intended.

Restoration of the [New Jersey] Trust Fund is more problematical since 100 percent of the dedicated revenues, about $900 million annually, are used for debt service compared to 30 percent for the [New York] SDF. Ultimately, it will be necessary to increase the dedicated revenue sources significantly so that the debt can be retired on an accelerated schedule while leaving some funds for infrastructure

renewal. The current annual $900 million of dedicated revenue would most likely need to be at least doubled to restore the Trust Fund to health and to facilitate basic infrastructure renewal. This would mean sizable increases in the gasoline tax, tolls, and fares and/or the creation of new revenue streams.

Once sufficient dedicated revenue sources are identified, it is important to find effective mechanisms to protect the funds from misuse. One possible solution is to establish federally mandated rules for the proper administration of these funds and to provide federal incentives/disincentives to enforce compliance. This could be accomplished at the federal level and on a national scale by legislation, for instance by earmarking a percentage of existing federal transportation aid to support state level dedicated funds specifically for transportation capital projects. The federal funds could "match" annual state and local contributions to the funds. Federal participation would need to be conditioned upon adherence to certain rules to prevent the use of the funds for unauthorized purposes– for instance "snow and ice removal" or other similar operating expenses. The State Trust Fund should also be protected from excessing borrowing by restricting or limiting the use of the funds for debt service payments. Since these funds could theoretically be used to match federal aid or to first instance reimbursable federal-aid projects, the states may see such a plan beneficial to their cash flow as well as their bottom line. If the federal funds are in addition to current federal-aid allocations, the incentive to participate in such a program would be even greater.

Innovative Finance

"Innovative Finance" for transportation projects has been around for nearly two decades since the mid-1990's when the U.S. Department of transportation initiated a number of pilot programs which have since been institutionalized by subsequent transportation bills. In general, innovative finance mechanisms established by the federal government and states make it easier to access large amounts of capital needed to fund large transportation projects and encourage public-private partnerships. The following is a brief description of the major innovative finance programs sponsored by the federal government.

Grant Anticipation Revenue Vehicles (GARVEEs) – This instrument allows states and other eligible jurisdictions to pay debt service expenses with future federal-aid highway apportionments provided the projects funded under this program meet the requirements for federal-aid. Federal-aid reimbursement cover debt related costs including payment of principal, interests, and financing costs for debt. GARVEEs allow states to bridge funding gaps, accelerate their capital programs, or allow funding of mega-projects using future federal aid. It does not, however, increase the revenue stream and debt payments would reduce the funds available for future projects unless additional revenue sources are identified. A similar program is available to fund transit projects and freight rail projects.

Build America Bonds (BABs) – This financing instrument, introduced by the American Recovery and Reinvestment Act in 2009, allows states and other political subdivisions to access private capital for transportation improvements. The interest paid on this debt is generally at a higher rate than state or municipal bonds and the issuers pay taxes on interest payments received. However, the federal government subsidizes the interest payments in order to reduce state and local government borrowing costs.

Private Activity Bonds (PABs) – The IRS tax code was modified to allow private participation in projects using tax-exempt bonds without losing tax-exempt status. The program, however, is limited to highway and freight transfer facilities. A public entity issues tax-exempt bonds on behalf of the private entity responsible for financing the project. The private entity is then responsible for all PAB debt payments and fees. This finance mechanism is intended to encourage public-private partnerships by lowering private borrowing costs for eligible public projects. This program is authorized to a $15 billion cap nationwide. As of October 2011, 12 projects have been approved for over half of the PAB authorization. Since PABs are repaid by private partners, there should not be an adverse effect on the availability of future revenue streams for transportation capital projects.

Transportation Infrastructure Finance and Innovation Act (TIFIA) – The TIFIA program allows the USDOT to be a direct lender to project sponsors under favorable interest rates and repayment options.

The loans can have a maximum term of 35 years and payments can be deferred up to five years after substantial completion of the project. The TIFIA loans are often used to fund new toll facilities because the delayed pay back option allows time for traffic and revenue to "ramp-up" to projected levels before incurring TIFIA debt service costs. The TIFIA loans cannot exceed 33 percent of the total eligible project costs and, therefore, these loans must be combined with other funding mechanisms. TIFIA project sponsors may be either public or private entities or both. The loans are subordinate to other loans, making it easier to obtain senior debt financing for the remaining project costs. In order to be eligible for TIFIA loans, the loan must be backed by tolls or other dedicated non-federal revenue sources. In addition to loans, the TIFIA program provides loan guarantees and a long-term (up to 10 years) line of credit.

Locally, there are two mega-projects that are potential candidates for TIFIA loans. The New York State Thruway Authority has recently submitted a letter of interest for a $2 billion TIFIA loan to help fund the $6 billion Tappan Zee Bridge replacement project. The Port Authority is expected to apply for a $1 billion TIFIA loan for the Goethals Bridge replacement. Both of these are tolled facilities and the revenues from tolls would have to be dedicated to the repayment of the TIFIA loans. Some estimates indicate that tolls would need to be doubled to finance the Tappan Zee Bridge replacement in the absence of direct federal or state aid.

USDOT received letters of interest for over $13 billion of new TIFIA loans in FY2012, including $2 billion for the Tappan Zee Bridge. Under current authorization levels, only a fraction of the TIFIA applications (less than $5 billion) can be funded. Therefore, it is highly unlikely that both the Goethals Bridge and the Tappan Zee Bridge projects would be funded with TIFIA loans in the near future. A significant increase in TIFIA loan authorizations could improve mega-project success rates provided that there are sufficient dedicated revenue streams to support the loans.

State Infrastructure Banks (SIBs) – SIBs are essentially state counterparts to the federal TIFIA loan program. As such, they are intended to provide revolving funds and loan guarantees for transportation projects using both federal and state funds. There are three accounts that can be established:

a highway account, transit account, and rail account. Up to 10 percent of federal-aid allocations along with state matching funds can be used to capitalize the SIBs. A New York SIB was established in 1997 jointly by FHWA, FTA, NYSDOT, MTA, and NYSTA. The fund was capitalized with only $15 million, of which 80 percent was federal. The local share was supplied by the Thruway Authority. No new loans have been issued since 2003 and the fund has a current balance of $10.7 million.[3] The Thruway Authority voted to dissolve the SIB at its February 2012 board meeting, subject to the approval of the other parties to the agreement that established the SIB, Given the low capitalization of the NY SIB, it could not function as an effective funding mechanism for mega-projects.

While innovative financing reduces borrowing costs and encourages private investment, it does not significantly impact on the revenue stream that must support both long-term debt payment and the ongoing capital program. As such, innovative financing can bridge temporary funding gaps and accelerate capital program delivery, but over-borrowing can jeopardize long-term funding availability for critical infrastructure needs.

Innovative Project Delivery Methods

A number of innovative delivery methods have emerged during the last two decades that involves streamlining the design and construction process. None of these measures address the issue of the overly burdensome and long-lasting planning and environmental review process that must precede the project approval and authorization to proceed to final design and construction. A brief summary of these innovative project delivery methods are presented below.

Design-Build (DB) Contracts – The traditional project delivery method, after funding approval, is to design the project, obtain the necessary agency permits and approvals, acquire right-of-way as needed, request bids for construction, award a contract usually to the low bidder, and then construct the project. There is a growing national movement to combine the final design and the construction phases using DB contracts and performance based specifications rather than detailed design plans. Under a DB contract,

[3] New York State Thruway Authority, Minutes of February 2012 Board Meeting

the contractor is responsible for preparing the final designs to sufficient detail in order to be able to build the project in accordance with the performance specifications. In most cases, the level of final design detail necessary under a DB contract is much less than a regular contract because the plans are not used for bidding purposes. And, because the design and construction is combined, design can often proceed in parallel with construction which can potentially reduce project delivery times in half. Moreover, any design errors are the responsibility of the contractor, not the project sponsor or its designer. Because DB projects are designed by the contractor, construction costs can be significantly lowered by incorporating the contractor's constructability and value engineering experience, available equipment and capabilities, and preferred construction method into the final designs.

New York State recently passed legislation enabling Design-Build contracts for certain state agencies, including the Thruway Authority and the Department of Transportation, for a period of three years as part of the "New York Works Infrastructure Act". [4] The Thruway Authority announced plans to award a DB contract in the Fall of 2012 for the replacement of the Tappan Zee Bridge (in time for the November general election). Governor Andrew Cuomo announced plans to award a DB contract for the first phase of the Kosciuszko Bridge replacement, also in the Fall, using $460 million from the newly created 'New York Works Infrastructure Bank'. (Funding for the second phase of construction has not yet been identified.) The Governor also announced plans to package multiple highway and bridge projects regionally into a single contract letting using both traditional Design-Bid-Build (DBB) and Design-Build (DB) delivery methods. If these plans are implemented, a direct comparison of these two project delivery methods should provide a basis for an interesting study.

Design-Build, Operate, Maintain (DBOM) – This project delivery method is an extension of DB described above whereby the contractor is also responsible for operation and maintenance of the facility for a fixed period of time after completion of construction. DBOM requires a private partner with experience in operating and maintaining the type of transportation facility constructed under the DBOM

[4] The effectiveness of the Design-Build project delivery method would be evaluated after the three year trial period.

contract. The Port Authority of New York and New Jersey used a DBOM contract successfully for the JFK AirTrain project. One of the prime contractor's sub-contractor, Bombardier Transportation, is under contract with the Port Authority to maintain and operate the AirTrain at JFK for a period of 15 years.

Design, Build, Finance, Operate, and Maintain (DBFOM) – This project delivery method is similar to DBOM, except that the private partner is also responsible for supplying the financing, in whole or in part, for the design and construction of the project. The debt is generally backed by user fees, tolls, fares or other dedicated revenues sufficient to cover the debt service, including the reserve fund, and contractor profits as well as operating and maintenance costs during the life of the contract.

DBOM and DBFOM contracts are potentially attractive alternatives to the traditional design-bid-build project delivery method because they offer speedy implementation and a potential for greater efficiency and lower costs when compared to publicly maintained and operated facilities. BDOM and DBFOM have been used successfully on a number of new toll roads in Texas and other parts of the country where TIFIA loans and have been combined with private investments to fund the capital costs.

There are some risks associated with innovative project delivery methods, namely the loss of a degree of public control over the project for a period of time. The main risk, however, is private partner disinvestment in maintenance in order to maximize profits. Once the contract period is over, the public is likely to inherit a facility that is in poor condition and in need of major rehabilitation or reconstruction. While initial reaction to DB, DBOM, and DBFOM project delivery methods have been positive, it will take long-term experience to determine whether these implementation methods are beneficial to the public.

Innovative Funding Mechanisms (Revenue Enhancements)

Innovative Financing and Innovative Project Delivery tend to speed the implementation process and lower long-term borrowing costs to the public, but they do not resolve the significant gap between available funding and transportation needs. According to a study by the Transportation Research Board

(TRB)[5], the average annual gap, from 2007 to 2017, between the available highway and transit revenues and transportation needs for all levels of government is estimated to be about $60 billion to maintain the existing system and about $120 billion to improve the existing system. The study implicitly assumes an annual 4 percent increase in total transportation revenues. The revenue increase projections are not likely to be realized since they are tied largely to gasoline tax revenues which have been declining due to lower vmt and more fuel efficient vehicles. Therefore, the estimated funding gap is likely to be even higher than projected. State governments also rely on declining gasoline tax revenues and face similar problems. Ironically, the increase in hybrid and all electric vehicles and the use of alternative fuels may, in fact, exacerbate the growing gap between transportation revenues and transportation needs.

Ultimately, annual transportation revenues will need to increase significantly in order to address serious infrastructure deficiencies. According to a RPA study, the current NJDOT and NJT annual transportation capital program of about $3 billion is only about half funded (largely because the Trust Fund is broke). The study concludes that "a few cents more on the gas tax won't solve [New Jersey's transportation funding] problem."[6] Acting NYSDOT Commissioner Stan Gee made similar comments at the New York State Infrastructure Summit: "…at current funding levels, we can fund less than half of our [$175 billion] 20-year needs … excluding the needs of the MTA, the Thruway Authority, and the New York State Bridge Authority."[7]

In the short-run, transportation revenues need to be increased at least 50 percent, and perhaps more, in order to begin to address the aging transportation infrastructure in the New York metropolitan area. In the longer-term, the revenue stream may need to be doubled in order to be able to fund mega-projects and reconstruct critical portions of the transportation system or provide meaningful system improvements. No single revenue source will solve the funding problem and, therefore, the solution must be multi-layered and oriented toward users and indirect beneficiaries in an equitable manner.

[5] NCHRP, "Future Financing to Meet Highway and Transit Needs", Web-Document 102, NCHRP Project 20-24(49), Transportation Research Board, 2006.
[6] Regional Plan Association, "Spiral of Debt", March 2010
[7] New York State Infrastructure Summit, Crowne Plaza Hotel, Manhattan, New York – Keynote Address, May 2009

Where Will the Money Come From?

There are a number of potential revenue sources available to provide adequate funding to meet existing and future transportation needs. They fall into two general categories: enhancing existing revenue streams through higher tax rates or creating new revenue streams. The following is a brief description and evaluation of potential means to increase revenues for transportation purposes.

a. Higher Gasoline/Fuel Excise Taxes

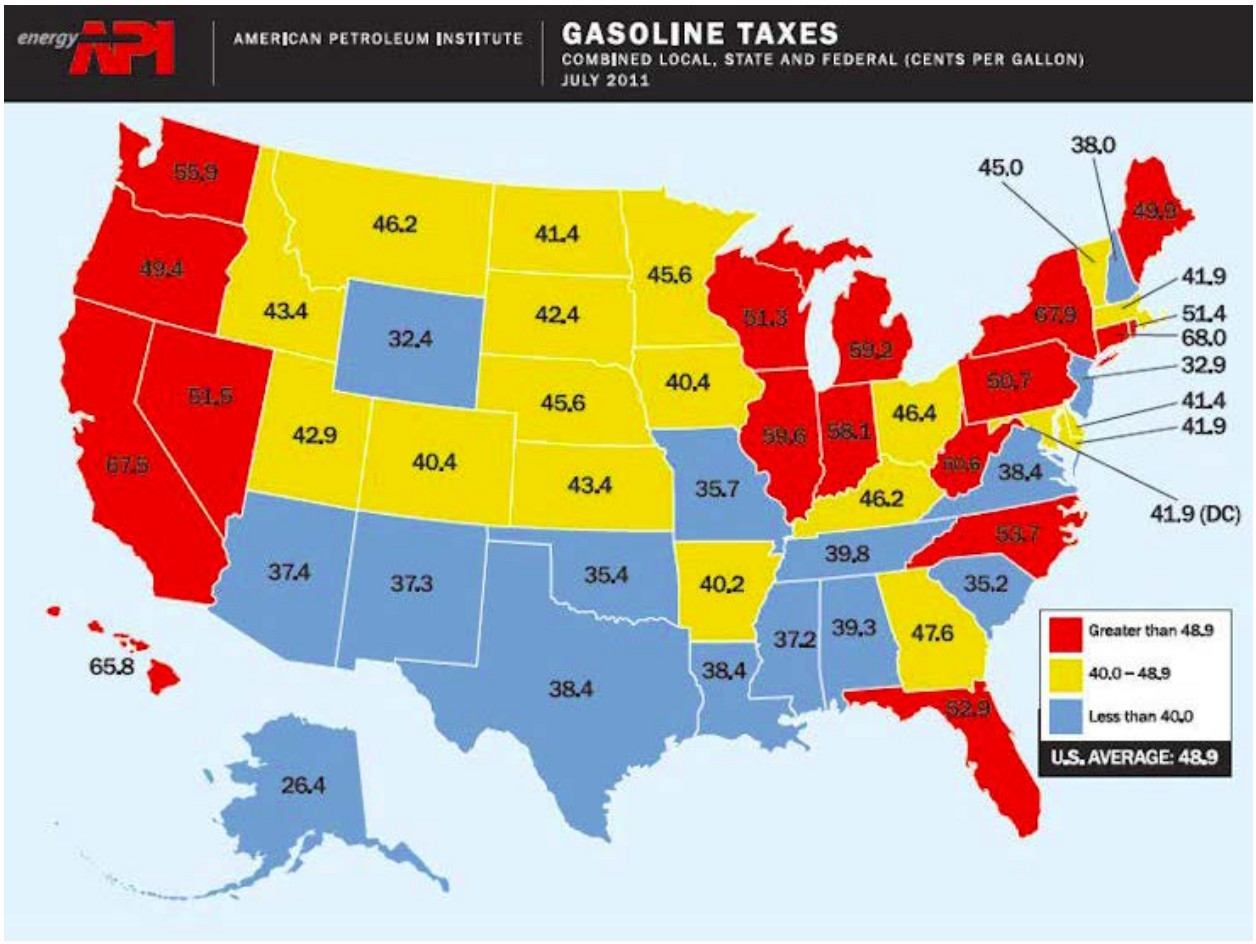
New Jersey's relatively low gasoline excise tax rate of 14.5 cents per gallon could be increased 5 cents per gallon to bring it in line with the national average of about 19 cents per gallon or increased 10 cents per gallon to bring it close to the New York and Connecticut gasoline excise tax rates of 25.8 cents and 25.0 cents, respectively. The increase in the excise tax could be implemented gradually, perhaps 1or 2 cents per year, so that its impact would be minimal. Even if the gasoline tax rate is increased 10 cents a gallon, it would represent less than a three percent increase in the price of gasoline at current price levels. A 10 cent per gallon increase in the fuel excise tax could generate up to $375 million a year in new revenue to fund transportation projects in New Jersey, an amount that would cover about 25 percent of the annual funding shortfall.[8] New Jersey Governor Chris Christie opposes any increase in the gasoline tax, but circumstances may dictate an eventual increase in the gasoline tax. New York's gasoline tax rate is already relatively high compared to other states, although some states have significantly higher gasoline excise tax rates.[9]

Many states also impose a sales tax on gasoline sales in addition to the excise tax which adds to the total fuel tax. In New York, the combined tax on motor fuel – including federal, state, and local taxes – is about 69 cents per gallon compared to only 33 cents per gallon in New Jersey. The national average total gasoline tax is about 49 cents per gallon. (See Figure 11-1.)

New York State has the second highest total gasoline tax per gallon in the nation, just behind Connecticut. By comparison, only two states have a lower total gasoline tax rate than New Jersey.

[8] Based on 75,000 million annual vehicle miles @ average of 20 miles per gallon fuel efficiency
[9] CA 41.2 cents, NC 39.15 cents, WA 37.5 cents, WV 33.4 cents, RI 33 cents

Figure 11-1



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The federal share of the gasoline tax is 18.4 cents per gallon which is used to fund the Highway Trust Fund (HTF) of which 20 percent is allocated to mass transit. A modest 5 cent increase in the federal excise tax could create an additional $6 billion in HTF revenues[10] to support both highway and transit programs. It is estimated that a 5 cent per gallon increase in the federal excise tax could increase federal aid for transportation about 25-30 percent. Since the excise tax is a fixed amount per gallon regardless of the price of gasoline, it would be beneficial to index this tax in accordance with the inflation rate so that the value of the revenue stream is not diminished over time.

[10] Based on 3,000,000 million annual vehicle-miles traveled nationally @ average of 25 miles per gallon fuel efficiency

In summary, increasing both the federal and state gasoline excise tax would not fully solve the substantial gap between available revenues and transportation needs, but it would help. Other revenue sources, as described below, must also be considered in order to help resolve the funding issue.

b. Increase the Sales Tax

Many states have dedicated a portion of the general sales tax revenues for transportation purposes, including New York. The MTA collects a 3/8 percent of the sales tax in the seven suburban counties outside New York City. Since the New York sales tax is already among the highest in the nation, and this revenue source is regressive, raising the sales tax further is not a recommended option.

c. Raise Existing Tolls

MTA Bridges and Tunnels (TBTA) operates 9 tolled facilities in New York City with cash tolls of $6.50 and discounted E-ZPass tolls of $4.80 on the major bridges and tunnels. The Port Authority of New York and New Jersey operates 6 bridges/tunnels between New York and New Jersey with tolls ranging from $7.50-$12 for a two way trip, depending on time of day and payment method. Some of the revenues charged at these tolled facilities are used to subsidize mass transit. Over the past several years both the PANYNJ and the TBTA have raised tolls at a rate significantly higher than the inflation rate and a further steep rise in tolls may result in lower traffic and revenues and less monies available to fund mass transit in the short-run. Therefore, the potential for increased tolls at existing bridges and tunnels as a means of providing significant additional revenues to fund regional transportation needs is limited in the short-term.

d. East River Bridge Tolls:

There have been a number of proposals since the 1970's to implement tolls on the four East River Bridges – the Brooklyn Bridge, Manhattan Bridge, Williamsburg Bridge, and the 59th Street Bridge. The early proposals met with considerable opposition because of issues related to queuing and delays at the proposed toll plazas. New non-cash toll collection technologies such as E-ZPass and Video Tolls have

eliminated this problem, but significant political opposition remains. The main issue is equity because tolls affect lower income residents disproportionately. However, if tolls are kept relatively low in relation to the TBTA tolls and Queens residents are given a discount or allowed (say) two free trips per month, it may be possible to overcome political opposition. Potential annual revenues from the institution of tolls on the East River bridges could range from $365-450 million per year.[11] This additional revenue stream could fund $10 billion worth of transit and highway mega-projects over a 25 year period.

e. Vehicle-Miles Traveled (VMT) Fees

Greater fuel efficiency and the growing number of hybrid and all-electric vehicles could significantly reduce the future revenue stream from gasoline excise taxes and gasoline sales taxes, the primary funding mechanism for transportation capital improvements. This has prompted serious discussion of alternative methods of collecting taxes not dependent on fuel consumption. A VMT tax, based on distance traveled has been suggested as a supplement or alternative to traditional methods of generating revenues. VMT fees have been tried in Illinois on a limited basis and tested in Oregon and 12 cities as part of a study by the University of Iowa. Germany has instituted VMT fees for trucks by number of axles. Israel, the Netherlands, and the United Kingdom have instituted a pay-as-you drive billing mechanism for insurance premiums based on mileage. According to a recent AASHTO study, a 1 cent charge per mile traveled could generate over $32 billion[12] in additional HTF revenues each year – more than double the current revenues. The average driver travelling 12,000 miles per year would pay about $120.

The VMT fees could be calculated using GPS and wireless technology to transmit vehicle-miles traveled to the Department of Motor Vehicles. The fees could be collected annually as part of the vehicle registration fee in order to minimize administration costs. As an alternative, the IRS could collect the VMT fees annually based upon a combination of mileage and annual income in order to promote equity.

[11] Based on 500,000 average daily vehicles on the four bridges @ $2-2.50 per trip

[12] AASHTO Center for Excellence in Project Finance
http://transportation-finance.org/funding_financing/funding/proposed_funding_sources/vmt_fees.aspx[4/23/2012 10:31:34 PM]

The GPS-based VMT funding mechanism could provide the capability to vary the fee by facility type and the time of day and serve as a powerful congestion management tool. The improved traffic conditions would reduce or delay the need for highway system expansion and funds can be targeted primarily to rebuild our aging infrastructure – for instance the Kosciuszko Bridge, the Gowanus Expressway, the BQE triple layer, and many other bridges and highways in need of major reconstruction or replacement. The additional funds generated by congestion pricing could provide a new revenue source for both transit and highway mega-projects. The GPS system could also calculate VMT by political jurisdictions and facility ownership to help guide funding allocation policies to insure that transportation funds are redistributed equitably. In order to implement the VMT fee system, automakers would likely have to install (tamper-proof) devices on all new vehicles. Owners of older vehicles would have to report odometer readings annually during the time of registration renewal. Over time, as older vehicles are retired, most vehicles would have the manufacturer installed GPS devices to facilitate automatic VMT fee calculation and billing.

f. Value Capture (Tax Increment Financing)

Value capture (VC) takes advantage of the increased property values along new transportation facilities. Property owners near stations or highway interchanges directly benefiting from the public investment are assessed higher taxes based on the increased value of their property. A portion of the tax increment is then used to pay for the transportation improvement in whole or in part. This method of generating revenue has been used successfully to fund the 1.5 mile extension of the #7 subway line in Manhattan from its present terminus at 42nd Street and 7th Avenue (Times Square) to 34th Street and 11th Avenue near the Javits Convention Center. New York City issued $2.1 billion in bonds to fund the construction of the project. The bonds were backed by the additional property tax revenues anticipated upon the completion of the project.

VC financing was used successfully to redevelop Denver's historic Union Station and the surrounding 20-acre area as a hub for a new transit system (FasTrak) and a revitalized urban center.[13] This $500 million project was funded by a mix of 9 different sources. The USDOT issued two loans, a $145 million TIFIA loan and a $155 million Railroad Rehabilitation and Improvement Funding (RRIF) loan totaling $300 million, or about 60 percent of the total project costs. The remaining $185 million was funded by seven other sources including $45 million from Colorado Department of Transportation (CDOT), $41 million from FasTraks, and $40 million from land sales. Public-private partnerships were formed with three private partners, the City and County of Denver, CDOT, and the Regional Transportation District (RTD). The private developers were responsible for redeveloping the 20 acre site surrounding Union Station including planning, development, finance, design, and construction. In 2008, the Denver City Council created the Denver Union Station Project Authority (DUSPA), a non-profit public benefit corporation, authorized to issue debt for the project. At the same time, the Council created a 30-year, 20-acre Tax Increment Funding (TIF) district centered on Union Station. The pre-development tax rates were frozen and paid to the City, but the increases in the taxes resulting from the development were directed to a special fund designated to pay the debt service for the TIFIA and RRIF loans.

Another example of the successful use of VC financing is the Atlanta Belt Line Project which is a comprehensive redevelopment plan and mobility project designed to reverse urban blight.[14] The $2.8 billion mega-project consists of a 22-mile transit loop primarily along abandoned rail lines, a 33-mile network of multi-use trails, 1,300 acres of new parks and green space, and 5,600 new units of affordable workforce housing. The project is funded by a variety of funding sources including private donations, as well as local, state, and federal funds. The bulk of the funding, about $1.7 billion, comes from Tax Allocation District (TAD) funds[15] generated by higher property values within the redevelopment district designated by the City of Atlanta.

[13] Metropolitan Planning Council, "Value Capture Case Studies: Denver's Historic Union Station", April 2012
[14] Metropolitan Planning Council, "Value Capture Case Studies: Atlanta Belt Line Project", March 2012
[15] Same as Tax Increment Funds (TIF)

Atlanta property taxes are shared by three separate entities (City of Atlanta, Atlanta Public Schools (APS), and Fulton County) that agreed to receive the property taxes at the fixed 2005 levels for a period of 25 years. Any additional tax revenues, the tax increment, are to be deposited into a TAD fund to help pay for the debt service on loans that funded the improvements. At the end of the 25-year period, the property tax revenues within the TAD are expected to increase significantly to about $20 billion over the 2005 levels.

A recent RPA study[16] looked at the effects of three New Jersey Transit rail projects on home values within two miles of rail stations that experienced improved service and used the findings to project the average increase in home values for the Access to the Core (ARC) project described in Chapter 8. The study concluded that homes near train stations experienced significant gains in value after the 'Midtown Direct', 'Montclair Connection', and 'Secausus Junction' projects were completed. Homes within two miles of the affected stations gained an average value of $23,000 with homes closest to the stations gaining nearly $34,000. The three projects increased aggregate home values by $11 billion and generated an additional $250 million in local tax revenues. The study correlated minutes of travel time savings to increased property values and increased tax revenues. Based on the results of the three rail projects analyzed, the RPA study concludes that the ARC project, if implemented, would increase average home values by $19,000. Aggregate home values are estimated to increase $18 billion with a potential increase in property tax revenues of $375 million per year. The RPA study suggests that the increased tax revenues, if dedicated to the ARC project, could provide sufficient revenues to cover nearly the entire project cost without raising any taxes. [17] It is unfortunate that Governor Christie did not consider innovative financing mechanisms such as Value Capture before canceling the ARC project in Fall 2010. The $3 billion federal New Start monies could have been combined with Value Capture financing to fully fund the ARC project without utilizing any other local funding resources.

[16] "The ARC Effect: How Better Transit Boosts Home Values and Local Economies", Regional Plan Association, July 2010

[17] Assumes a 5% interest rate and a 30-year payback period

David Koons, RPA Vice-President and Connecticut Director, in a recently posted article on the RPA website,[18] suggests that Value Capture, a variation of Tax Increment Financing, could be applied along the New Haven-Hartford-Springfield rail corridor help fund major rail improvements being planned by Connecticut DOT. He says that "…value capture should be seen as another method of public-private financing, one that taps into future private wealth that public infrastructures creates, and uses it to create that infrastructure."

Conclusions: Mega-Project Finance

Mega-Project delivery outcomes are tied to the general funding gap between available resources and funding needs. There are a number of measures available to remedy one of the primary causes of mega-project implementation failures – the lack of adequate funding. Innovative financing, public-private partnerships, improved project delivery methods, increasing existing revenue streams, and the creation of new revenue sources need to be considered in the mix of measures to improve the success rates of mega-projects.

Most likely, the burden for paying for highway and transit transportation improvements must fall increasingly on users and property owners who benefit the most from public infrastructures investments because general revenues are stretched to the limit to pay for other state and local expenditures such as debt service, state operations, education, police, fire, sanitation, social services, and other essential services.

Because of the intense competition for funds, mega-projects (as well as other priority transportation projects) need to be freed from the vagaries of the annual budget cycle. The revenue stream should be steady and dependable in order to allow long-term commitment of funds. And most importantly, existing and any new revenue streams must be adequately protected from misuse and diversion to non-transportation uses.

[18] Koons, David, "An Appealing Way to Fund Transportation Projects", RPA, March 2012

The creation of a New York State Transportation Infrastructure Finance Authority should be considered with the legal authority to float bonds backed by a dedicated revenue stream and to enter into agreements with transportation operating agencies and public-private partnerships to fund system expansion projects backed by tolls. The Authority could also be empowered to develop a regional transportation plan in concert with the MPO and member agencies focusing on major transportation system investments. If the funds provided to the Authority are in addition to current funding allocations to NYMTC member agencies, there should not be a strong resistance to the formation of a new organizational entity. The Infrastructure Authority should have a secure revenue source protected by an amendment to the state constitution.

Finally, we must continue to focus on reducing costs in order to increase the purchasing power of available funds. This could be accomplished by public funding of research and innovation to find ways to reduce maintenance, operating, and construction costs. Public procurement for innovation and research efforts should engage a wide variety of public and private organizations including the engineering, construction, and academic community (Lember, Kalvet, and Kattel 2010). Transportation cost reduction has national application and, therefore, funding research efforts to reduce costs should be a federal priority.

In summary, the transportation funding problem is serious but not insurmountable. Political courage and leadership are needed on the part of our elected officials in order to effect fundamental changes in the way transportation is financed, particularly for mega-projects requiring long-term funding commitments. Long-term funding commitments must be assured by enacting the necessary constitutional amendments to create new and resilient institutional structures that provide adequate long-term revenue streams protected from competing financial pressures inherent in the annual budget cycle.

Chapter 12 – Agency Issues

Mega-projects tend to require many agency approvals – typically in the range of 15-20 different agency approvals or more – depending on the scope of the project and its impacts. Many of the approving agencies are involved during all three phases of the implementation process (planning, design, and construction) and approve or sign off on transportation project multiple times. A partial list of the federal, state, and local approving agencies for projects located within New York City is shown below:

- USDOT/FHWA/FTA/FAA*
- US Coast Guard
- US Army Corps of Engineers
- US EPA*
- US Department of the Interior
- US Fish and Wildlife
- Port Authority of New York and New Jersey*
- New York State Department of Transportation*
- NY Metropolitan Transportation Authority (and its subdivisions)*
- NYS Department of Environmental Conservation*
- NYS State Historic Preservation Office*
- NYC Department of Transportation*
- NYC Department of Design and Construction*
- NYC Department of City Planning*
- NYC Landmarks Preservation Office
- NYC Department of Parks and Recreation*
- NYC Department of Environmental Protection*
- NYC Economic Development Corporation
- NYC Police Department*
- NYC Fire Department*
- NYC Sanitation Department*

Note: An asterisk (*) denotes agency involvement on most transportation mega-projects in NYC.

It is not unusual for mega-projects to impact the facilities of other transportation operators, especially in a dense urban environment, that must also sign-off on the project. For instance the JFK AirTrain project impacted the MTA's LIRR Jamaica railroad station and the Van Wyck Expressway which is owned by NYSDOT and maintained and operated by NYCDOT. The ARC project impacted

Amtrak's Northeast Corridor service and the LIRR service at Penn Station. The Nassau Expressway project impacted JFK Airport operations involving the PANYNJ and the FAA in the review process. The impacts on other transportation operators trigger extensive coordination, reviews, and negotiations among the affected agencies.

The number of agencies involved in the review process and the open ended review timeframes practiced by some agencies are a significant cause for project delays, particularly during the planning phase of project implementation. The five case studies presented in this thesis experienced long planning phase durations ranging from 8-30 years. A significant component of the delays during the planning process is attributable to the large number of review agencies involved and the delays in getting responses.

While project delays make it more difficult to implement mega-projects and can potentially provide opportunities for opposition groups to mobilize or for election cycles to result in diminished political support[1], there is no direct evidence that these delays are the major cause of mega-project implementation failures. Four of the five case studies analyzed successfully completed the planning and environmental review process and received approval to advance to final design and construction. Only the Westway project failed to get approved. But it can be argued that a successful Route 9A project emerged from a continuation of the Westway planning process to its logical conclusion.

The agency review process, while not believed to be the direct cause of implementation failure, can and should be improved. Several interviewees who reported difficulty in obtaining timely reviews and responses from some review agencies suggested that review agencies should be required to respond to submittals within a set time period of 30 or 45 days.

Another effective method of improving agency review performance is the execution of project specific inter-agency agreements that clearly sets forth the responsibilities and obligations of each agency

[1] Election cycles can also increase political support, as evidenced by newly elected Governor Cuomo's strong support for the replacement of the Tappan Zee Bridge.

with respect to coordination, review, and sometimes funding of mega-projects. One of the reasons that the AirTrain project was so successful is because it entered into an agreement with the New York State Department of Transportation that defined the relationship between the two agencies and the coordination and review protocols that were to be followed. The Tappan Zee Project is another example of the use of an interagency agreement to speed the review process. It should be noted that both the AirTrain project and the Tappan Zee Bridge project received strong executive support from the governor who encouraged state agencies to cooperate.

Another possible method of streamlining agency reviews for transportation mega-projects is to create a multi-agency (federal, state, and local) review committee that would provide a coordinated, consistent and timely review of all projects exceeding (say) $500 million in cost or a project that is declared a priority by the governor. A multi-agency review committee would provide the convenience of "one-stop-shopping". It would also allow negotiations to occur among the agency stakeholders to resolve conflicts.

While shortening interagency review times would help reduce project implementation delays, it would not significantly reduce the overall duration of the planning process which is deeply imbedded in a host of institutions forged in a climate of distrust and intense social unrest in the 1960's. The key to improving the delivery of transportation mega-projects (and other projects as well) is to strike a reasonable balance between the protection of civil society and the environment and the ability of the state to provide essential public infrastructure that benefits the region.

In practice this would mean relaxing some of the regulatory requirements and raising the impact threshold (some) to reduce the requirement for time-consuming technical analyses and the effort required by reviewing agencies to analyze them. Institutional reform would have to begin by a careful review of all the regulatory requirements in terms of the burden it places on mega-projects and whether that burden is justified by the expected outcome of the regulation.

One example is the need to do extensive air quality analysis for capacity improvement projects when USEPA's statistics indicate that, nationally, air pollution from mobile sources decreased over 80 percent from 1970-2010 even though vehicle miles of travel doubled during the same period.

Air quality has improved dramatically in the last 40 years largely because motor vehicles are much cleaner, not because there is less travel. Therefore, efforts to reduce air pollution further should focus on making cars even cleaner by continuing to encourage and invest in technological innovations to achieve near zero vehicle emissions. Once the need for air quality analysis at the project level is eliminated or reduced, it should also be possible to reduce the amount of traffic modeling work that is needed to support the air quality modeling.

Are we preparing too many EIS documents? One interviewee stated that "there is a strong push to do an EIS for all large reconstruction projects whether there are any known impacts or not." The reason for preparing a full EIS is because, under USEPA rules, traffic impacts during construction lasting longer than two years are not considered 'temporary' impacts and, therefore an EIS must be prepared. Most mega-projects have traffic impacts that are typically longer than two years. Perhaps it would be wise to increase the temporary traffic impact duration threshold to 30 months or even 36 months. The modification of the threshold could be justified by the increased frequency of maintenance and emergency repairs needed because of delays in implementing a reconstruction mega-project. A systematic review of impact thresholds and their logic could lead to a significant reduction in the number of EIS's that have to be prepared for basic infrastructure renewal projects.

Consideration should be given to a new EIS category, called a 'Targeted' EIS, that would cover a limited range of impacts, for instance traffic impacts during construction. No need to do a full EIS when there are no other impacts.

A degree of public trust will be required in order to institute meaningful reforms. One strategy might be the establishment of pilot programs aimed at gauging the effects of regulatory reform. Slow, steady change, and appropriate course corrections, might be the best approach to take with a wary public

and watchful environmental groups, but eventually it would become easier to implement transportation mega-projects that would improve the quality of our lives and improve the economic health of the region.

Lapp and Munoz-Raskin (2007) note that there is a cultural bias against mega-projects borne out of an inherent distrust of government. The case studies presented in this thesis confirm that there is an initial public distrust and wariness that must be overcome quickly during the initial stages of mega-project planning. Shortening the planning process and streamlining reviews and approvals would help change the negative image of government and reassure the public that government works. Building public trust is a key prerequisite for successful implementation of mega-projects.

Chapter 13 - Summary of Findings

- Based on the five case studies presented in this thesis and other mega-projects reviewed, funding and community and interest group opposition are the primary causes of mega-project implementation failure in the New York City metropolitan area. However, technical failures and the manner in which mega-projects were executed contributed to community and interest group opposition and the withdrawal of funding commitments (e.g. Westway and ARC).

- Institutional conflicts created by NEPA and other federal, state and local environmental laws, enacted in the late 1960's and early 1970's in the aftermath of environmental protests, pose significant obstacles to timely mega-project implementation, but there is no direct evidence, based on the case studies analyzed, that they are the primary reasons for mega-project failures. However, there is strong evidence that project sponsors carefully calibrate project attributes to minimize impacts in order to avoid institutional conflicts. Project selection during the planning process is strongly influenced by institutional constraints and there is anecdotal evidence that some agencies attempt to avoid initiating projects that may potentially require an EA or an EIS.

- The New York City urbanized area lacks a unified vision of the future transportation system and, therefore, there is an undue burden placed on mega-project during the planning and development phase to perform system planning in the form of Major Investment Studies (MIS). These studies are costly and time-consuming and they cannot substitute effectively for comprehensive systems planning at the regional level. At present, the MPO "folds in" plans and projects of other agencies into its Regional Transportation Plan. The role of the MPO should be strengthened to enable comprehensive policy, regional transportation, and land use planning in an active rather than a reactive manner. (Lapp and Munoz-Razkin, 2007)

- A lack of funding has been identified as one of the main obstacles preventing the timely implementation of mega-projects in the New York City metropolitan area. There are insufficient funds available to maintain the existing transportation system in a state of good repair and there is an increasing reliance on "emergency repairs" to keep the aging transportation infrastructure intact. Therefore, funding availability for mega-projects, especially for system expansion, is not likely to improve until overall funding for transportation is significantly increased.

- The State Dedicated Fund for Bridges and Highways (SDF) should be restored to its original purpose. The dedicated funds need to be protected from being diverted to other uses by increasing the transactions costs of fund transfers or by providing strong incentives to maintain these dedicated funds. The use of the SDF funds should be exempt from the annual budget appropriation process. A constitutional amendment is recommended to protect these funds from being diverted for other purposes.

- New revenue sources need to be identified to address the dire transportation funding problems at the federal, state, and local levels to provide adequate funds for both infrastructure renewal and transportation system expansion.

- Consideration should be given to the creation of a New York State Transportation Infrastructure Finance Authority with the power to issue bonds backed by new dedicated revenue sources. The Authority would enter into funding agreements with project sponsors to facilitate the implementation of mega-projects. The Authority would also be mandated to work with the MPO and member agencies to develop a unified vision of the future and to develop a regional transportation plan that is forward looking. The proposed Authority should be insulated from day-to-day political influence and the annual budget appropriation process. The focus of this new institution would be to provide funding for large-scale transportation projects, both highways and transit, that are beyond the ability of transportation agencies to fund within their capital programs.

- Mega-projects take too long, often decades, to implement. Some of the delays are attributed to the lengthy agency reviews. Reviewing agencies currently enjoy an open-ended timetable for reviewing project submissions. Consideration should be given to the establishment of a fixed period for review agencies to provide comments. Consideration should also be given to an adjustment of the impact thresholds to more reasonable levels so that environmental reviews can be reduced and project implementation can be speeded up.

- Institutional reform in the form of new legislation and regulatory reform should be considered to reduce the "embeddedness" of the planning process in institutions forged in an era of great public distrust in the 1960's. Institutional changes need to be implemented gradually, and in small increments, in order to establish public trust. The institutional changes should strike a reasonable balance between the protection of civil society and the environment and the economic health of the region.

- Consideration should be given to a new category of "Targeted Environmental Impact Statements" for mega-projects with limited, but significant, impacts during construction – for instance traffic impacts longer than two years in duration – in order to reduce the need for a full EIS.

- A Task Force should be created by the federal government and state governments to review the efficacy of environmental laws and regulations applicable at the project level. Consideration should be given to broad policy goals as a means of achieving environmental goals rather than burdening individual projects with detailed quantitative analysis and modeling with dubious value.

Epilogue

During the Robert Moses era, between the 1920's and 1960's, there was a grand vision of the future and the political leadership and ingenuity to turn vision into reality. Moses was a prolific builder – but, unfortunately, at times at the expense of democratic ideals, community cohesion, and environmental quality. There was construction of new public facilities everywhere, but little public participation in the planning of those facilities.

Today, the institutions governing the planning process provide maximum protection of communities and the environment while attempting to be democratic. But the current planning process produces few successful mega-projects and the ones that do get implemented take decades to complete. The emphasis has shifted from concrete accomplishments to process. Planning has become an end to itself replacing plan implementation as a primary goal. Consequently, we have much planning but few tangible results.

Moses was said to have a sign on his door with a favorite motto: "You can't make scrambled eggs without breaking the eggs" (Caro 1974). Perhaps we do not have to break the eggs to make an omelet, but instead poke a little hole and extract the essential ingredients. But even poking little holes will require institutional and regulatory changes and much innovation to minimize harm.

It will take some soul searching and honest reflection to admit to ourselves that the planning process is broken. The great ideal behind NEPA and complementary state/local laws and regulations was indeed noble, but it is time to take a hard look at the institutional framework underpinning the project implementation process and how it can be transformed to meet the needs of the 21st century while providing adequate protection of civil society and the environment. We need to find an acceptable balance between Robert Moses's expedient autocratic methods that accomplished much but sacrificed democratic

principles and the current practice of endless participatory planning that often leads to mega-project failure.

The environmental laws and regulations governing the planning and implementation of large-scale transportation projects need to be thoroughly reevaluated with greater differentiation between large-scale infrastructure renewal mega-projects and mega-projects that expand the existing transportation system. We also need to consider increasing the thresholds that trigger a full Environmental Impact Statement (EIS) so that projects having a relatively small (but not insignificant) impact can move forward more expeditiously without the need for a full EIS.

Fixing the institutional framework governing the project planning and approval process, however, will not be sufficient. Even if the major institutional barriers are eliminated, mega-project implementation success rates are not likely to improve significantly without a substantial increase in transportation funding at all levels of government.

The “planning paralysis” evident in the New York region combined with the lack of adequate funding jeopardize the long-term viability of the region’s transportation system and the economic health of the New York metropolitan area. Institutional reform will be needed not only to streamline the planning process but also to restructure the current method of funding transportation projects in order to create a reliable and stable means of paying for transportation improvements.

Mega-project implementation processes (relating to planning, design, funding, and construction) are deeply embedded in institutions that originated nearly half a century ago. The trend has been to further embed the implementation process with new layers of regulations promulgated by the federal and state governments that tend to further increase project schedules and costs and reduce the likelihood of successful implementation outcomes. It will take a tremendous sustained effort to begin to reverse the formidable barriers to successful implementation of large-scale transportation projects and, in particular, mega-projects. Any meaningful institutional change is likely to be evolutionary rather than revolutionary.

The lessons learned from failed (and successful) mega-projects in the New York City metropolitan area and elsewhere in the U.S. could provide a starting point for developing an effective strategy for institutional change leading to the establishment of a new equilibrium between the "free-market" and civil society that produces a better balance between transportation and economic needs and the protection of civil society and the environment.

Ultimately, courage and leadership will be required in order to effectuate meaningful institutional changes in the face of deeply entrenched interests in order to fix our aging transportation system and provide capacity improvements to handle future growth. The status quo cannot be sustained in the long-term because it will lead to economic stagnation and decline. As planners, we need to take a leadership role in bringing about change. Otherwise, planners and planning may be at risk of becoming irrelevant.

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APPENDIX

Interview Questions

"Challenges in Implementing Transportation Mega-Projects in New York"

Interviewee: _____ Date: _____ Time: _____

Mega-Project Name: _____

Project Sponsor: _____ Est. Construction Cost: _____

1. Interviewee Mega-Project Role/Responsibilities:
    a. What was your role on the <Name of Mega Project>
    b. When did the project start and end? (initial project proposal/construction completion)
    c. When did you join the project team?
    d. How long were you involved with the project?

2. Project Evolution:
    a. How did the initial project proposal emerge? (Infrastructure condition, safety, congestion management, other – complaints from community/elected officials)
    b. What were the main goals and objectives?
    c. How did the project scope change over time?

3. Agency Involvement:
    a. Which agencies were most involved?
    b. What were the critical inter-agency issues?
    c. How were inter-agency issues resolved?
    d. How did inter-agency issues affect the project schedule?
    e. How did inter-agency issues affect the project cost?
    f. Was inter-agency involvement positive or negative? Explain.

4. Community and Public Interest Group Involvement:
    a. Which communities/groups were most involved?
    b. What were the main community concerns/issues?
    c. How were these issues resolved? Were the issues resolved in a timely manner?
    d. Did community ask for incidental enhancements?
    e. How did community issues affect the project schedule?
    f. How did community issues affect the project cost?
    g. Was community involvement positive or negative? Explain.

5. Business Community Involvement:
    a. What were the main interests/issues raised by the business community?
    b. How were these issues addressed by the project?
    c. Who were the main actors?
    d. Was business community involvement positive or negative? Explain.

6. Facility Users:
    a. Were potential users of the proposed facility engaged in the planning process?
    b. What were the main issues expressed by user groups or individual users?
    c. How were the views of users incorporated into the planning process?
    d. How did they influence the outcome of the project?

7. Elected Officials Involvement:
    a. Who were the main proponents/opponents of the project?
    b. What were the main issues raised by elected officials?
    c. How were these issues resolved?
    d. How did the positions of elected officials influence the outcome of the project?

8. Engineering/Design Issues:
    a. Were there any design challenges that affected the project?
    b. How were these challenges handled?
    c. Was there an impact on the cost? Schedule? Scope?

9. Project Cost:
    a. What was the initial project cost?
    b. What was the final cost of the project at completion (or when terminated)?
    c. What were the major factors affecting cost increases?
    d. To what extent did project mitigation and enhancements affect the final costs?
    e. How can project cost increases be better controlled?

10. Project Schedule:
    a. What was the initial project schedule?
    b. How did the initial project schedule change over time?
    c. What were the main factors contributing to project delays?
    d. How can the project schedule be improved?

11. Funding:
    a. What was the main source of project funding for planning, design, and construction?
    b. Was the funding source a dedicated fund source?
    c. How were additional funds obtained as costs increased?
    d. Was the funding source stable over time?

12. What policy or procedural changes can you suggest that would improve the delivery of transportation Mega-Projects in terms of timely completion, cost containment, and stakeholder satisfaction?

13. What institutional and/or organizational changes would you recommend that would improve the delivery of transportation Mega-Projects?

NOTES: