

2018

The missing link: a century-long story of public transit infrastructure in Boston

Michael Scarlett
Vassar College

Follow this and additional works at: https://digitalwindow.vassar.edu/senior_capstone

Recommended Citation

Scarlett, Michael, "The missing link: a century-long story of public transit infrastructure in Boston" (2018). *Senior Capstone Projects*. 760.
https://digitalwindow.vassar.edu/senior_capstone/760

This Open Access is brought to you for free and open access by Digital Window @ Vassar. It has been accepted for inclusion in Senior Capstone Projects by an authorized administrator of Digital Window @ Vassar. For more information, please contact library_thesis@vassar.edu.

The Missing Link:

A century-long story of public transit infrastructure in Boston

Michael Scarlett

April 27, 2018

Senior Thesis

Submitted in partial satisfaction of the requirements
for the Bachelor of Arts in Urban Studies

Advisor, Tim Koechlin

Advisor, William Hoynes

Table of Contents

Acknowledgments.....	2
Chapter I: Introduction.....	3
Chapter II: “The Cost Must Be Great”.....	12
Chapter III: A New Era for Transit.....	27
Chapter IV: State of the City.....	42
Chapter V: Conclusion.....	48
References Cited.....	51

Acknowledgements

Writing this thesis was an incredible learning experience and I am grateful for all the help I received along the way.

Thank you to my advisors, Professors Tim Koechlin and Bill Hoynes, who provided guidance and feedback throughout in a helpful and patient manner. They are both kind and genuine people and Vassar is better off because of them.

Thank you to the numerous people who helped me formulate my ideas by giving me their time and energy during this writing process. Brad Bellows, a tireless advocate of the North South Rail Link, was extremely helpful with his constant feedback. I also benefited immensely from the help of Michael Dukakis, Alan Altshuler, David Luberoff, and Josh Fairchild, who were all generous with their time. These people, along with many others who allowed me to interview them, read sections of my writing, or sent me source material, each played a significant role in the completion of this thesis.

I would be remiss if I did not thank my best friends, Violet, Eric, Luke, and Peggy, who were supportive and caring throughout this lengthy process. As I am writing this, however, I am realizing that Violet is the only one who actually helped me with the final product. The others were only good for their off-color jokes.

Lastly, I would like to thank my parents, who have been unbelievably supportive this year (not to mention the previous 21). I would not be here if it weren't for their constant guidance.

Chapter 1: Introduction

In 1862, Republican Congressman Timothy Phelps stood under a partially built dome in front of a half-filled chamber. His goal was to convince his fellow representatives to seize this imperative moment in history and shape the future of American transportation. Nearing the end of his impassioned speech, he asked: “For what are Governments formed if not to protect their citizens...to secure their happiness and promote their general welfare? And are they restricted in the manner in which they shall protect their citizens or promote their general welfare?”¹ This question was meant to underline a fundamental disagreement over the role of government, helping bring closure to a decade-long debate. What began as an argument concerning railroad funding had transcended into a question of vision for the nation.

For years, Republicans had advocated for investment in a service they believed would benefit citizens across the country. Prior to this debate, private interests fueled development for many years throughout the country with little regulation or support from the state. Urban sociologists John Logan and Harvey Molotch note this as a unique characteristic of a young country: “In contrast to the explicit government intervention that has marked other societies, the United States became an industrial nation with relatively little constraint placed on the wheeling and dealing that distributed populations and business activities across the land.”² The privatized nature of transportation gave increasing amounts of wealth and power to a handful of individuals over the course of the 19th century as the Democrats had successfully defended their free-market

¹ *Congressional Globe*, 1862, House of Representatives, 37th Congress, 2nd Session, 1591.

² John R. Logan and Harvey L. Molotch. *Urban Fortunes: The Political Economy of Place* (Beverly Hills: University of California, 1987), 151.

ideals; “...virtually any proposals for explicit intervention...were anathema.”³ This reality led to a general acceptance that private interests would shape the transportation networks around the country. During a debate on the floor just a few years prior to Phelps’ speech, Democratic Senator William Smith of South Carolina claimed, “It will do for gentlemen to talk about and make capital of; but the idea of building a road with the aid of the Federal Government, is to me an absurdity.”⁴ This fundamental disagreement impeded the nation builders from moving forward with their vision for years.

In 1862, however, during a unique moment in history, the Republicans of the 37th Congress received an outright majority after eleven states seceded to form the Confederacy. It was only then, with the nation’s future in question, that the remaining Representatives passed a bill to fund the Transcontinental Railroad. It was an unusual set of circumstances, but the debate helped to serve as a blueprint for future questions regarding government investment. The vision set forward by Republicans in the 37th Congress created lasting and impactful infrastructure that changed the American landscape and shifted the public’s expectation of the state. Soon enough, as immigration to urban areas increased, the onus was placed on cities and states around the country to create their own vision of growth.

In the 150 years following the original debate, the importance of transportation infrastructure and the necessity of visioning a plan for the future has continued to be essential to growth. Particularly in urban areas, finding the most effective means of transporting people and goods is a top priority, which is why transportation networks are often referred to as the “lifeblood” of cities.⁵ As cities grow, the ability to effectively plan and complete these networks

³ Ibid.

⁴ *Congressional Globe*, 1857, 35th Congress, 1st session, 352.

⁵ Vukan Vuchic, *Transportation for Livable Cities* (Milton: Taylor and Francis, 1997), 24.

becomes increasingly difficult, but it also becomes all the more necessary. Providing well-planned and sustainable transit systems will be paramount for successful cities of the future.⁶

Of course, there is an economic impetus for efficient transportation networks: mobility is vital to the economy. But the role of transportation is multi-dimensional, with implications that reach beyond financial systems. Residents in cities with congestion experience longer journey times, increased risk of accidents, higher energy consumption, and worsening environmental issues.⁷ Naturally, along with most social ills plaguing society, the costs of these problems fall disproportionately on less advantaged citizens, and studies have shown that the lack of transit opportunities contributes to the increasing inequality in cities today.⁸ For this reason, transportation plays a social role in cities as well.

Addressing these problems is not easy. Infrastructure investments are almost always expensive, but that does not make confronting these issues any less important. Cities of the future cannot simply be economically efficient and prosperous; they must be centers of social cohesion that help to mitigate environmental problems while providing equal opportunities for citizens. This ideal future will not occur naturally - it is rare to come across a city with transportation infrastructure that can be lauded as comprehensive. Only with rigorous planning and clear visions will efficient transportation networks be developed. And only with a focus on sustainability - environmental, economic, and social - will cities be able to grow in ways that benefit all.

⁶ While there has been debate around autonomous vehicles being the future of transportation, it is extremely unclear what the timeline or regulation looks like. In a 2018 MassINC poll, only 9% of respondents agreed with the statement: “Self-driving cars will largely replace public transportation like the MBTA. We don’t need to worry about making big investments in public transportation.”

⁷ Arthur Cecil Pigou, *The Economics of Welfare*. (London: MacMillan, 1920).

⁸ Helena Titheridge et. al, “Transport and Poverty,” *University of College London Press*, 2014, 5.

I contend that solving these problems in the long term is not viable if public officials only consider the cost-benefit analyses of potential solutions. Solely understanding a project through dollars and cents impedes cities from progressive and sustainable investments. Cost-benefit frameworks offer a perspective that can be useful to consider, but the most significant and lasting investments in the world's great cities have typically not been constrained by these numbers.

In this thesis, I look at specific public transit debates to help understand what creates opportunities for successful infrastructure. I explain how stakeholders and key forces that lie behind meaningful public investment have shifted over time, while others have stayed constant. Lastly, I conclude that the need for more visionary planning, along with political leadership, in the present day is more important than ever before. Using Boston's proposed North South Rail Link as my primary case study, I will show how the debate over this key piece of infrastructure has shifted over time. Additionally, I will draw on other transit projects in Boston, including the first subway, the expansion of highways, and the Big Dig, to emphasize how the local and national political climates inform transit debates. This story integrates political forces, economic policy, urban planning strategies, and media coverage, while shedding light on how Boston has ended up in its current state of congestion.

What is the proposed North South Rail Link?

The North South Rail Link (NSRL) is a plan to connect the two major train terminals in Boston with an underground tunnel just over a mile in length, running beneath the city center. This plan was pursued by both private interests and politicians in the early 1900s to negate the inefficiencies caused by having two major stations in the same city. North Station and South Station, each built by different investors that did not communicate beforehand, lie exactly 1.2

miles apart with no tracks connecting them. For the past 100 years, as Boston has grown into the city that it is today, this missing link has been a glaring flaw in a city that serves as a regional hub.

In Boston's current state, North Station serves as the end of the line for any train running north of the city. South Station serves as the end of the line for any train running from the south. For commuter trains, as well as regional lines such as Amtrak, this means that a visitor, or commuter, is only able to easily access half of the city. The result is a fragmented region with huge inefficiencies, forcing workers and employers to find other ways of accessing their destination. For many commuters, the only option is driving. This contributes to the highway congestion that plagues greater Boston and creates an unequal distribution of economic access. The rail infrastructure that has serviced the entire region for over a century- including well trafficked lines that run to New Hampshire, Maine, Connecticut, and New York - falls far short of reaching its potential.

Proponents claim the NSRL is an essential piece to achieve a sustainable and effective regional transportation network, but it would likely cost over \$3 billion. Despite being defeated time and time again, the idea has persisted, and has garnered an impressive amount of support over the past two years. Over the past century, the players in the debate have shifted, media coverage has fluctuated, and the sentiment of Boston residents has changed. This case study gives insight into some of the most pertinent questions that cities face today. What does it take to create impactful infrastructure projects? How have visionary political leaders pushed for projects with high upfront costs but long-term use value in the past? How do these events inform the critical moment in urban growth today?

The Growth Machine

The city, Robert Park once wrote, “is man's most consistent and on the whole, his most successful attempt to remake the world he lives in more after his heart's desire.”⁹ Park, who conceived of the idea of urban ecology, believed that the formation of communities in urban areas reflected the processes of plant and animal habitats. His idea, along with those working in the Chicago School, was that natural competition occurring in cities, not dissimilar from the idea of the invisible hand, would help ensure that each organism ends up in its ‘optimal’ location: “The process results in the regulation of numbers, the distribution of vocations, putting every individual and every race into the particular niche where it will meet the least competition and contribute most to the life of the community.”¹⁰ This framework, entrenched in the idea that the free market shapes our cities for the best, served as a popular viewpoint for many years. But in recent decades, it has become increasingly clear (and recognized) that the ecology framework ignores many underlying factors affecting city and regional growth. Understanding where the power lies, who wields it, and how it is utilized has massive implications for the form a city will take.

John Logan and Harvey Molotch do not see such a natural creation of urban form. *Urban Fortunes*, a comprehensive and groundbreaking look at the way cities are built, introduces the idea of cities as a Growth Machine. Like Park, they see a natural interaction occurring in cities, but they do not see this as inherently positive: “Indeed, people literally conspire (breathe together) as they try to arrange the city to fulfill their ambitions. Public benefit can happen too, but it is never to be taken for granted.”¹¹ These people with unique ambitions- individual actors with selfish interests - can be understood through two groups (broadly speaking): those searching

⁹ David Harvey, “The Right to the City,” *New Left Review*, October 2008, 53.

¹⁰ Robert Park, *Human communities; The City and Human Ecology* (New York: Free Press), 161.

¹¹ Logan and Molotch, vii.

for exchange value and those searching for use value.¹² While exchange value is the amount something is worth (or the monetary value that can be extracted from it), use value is the intrinsic value to the citizens who call the city home (and often lacks an easy form of measurement).

The authors explore the conflict between these two ideas of value, which lead to an understanding of the “political dynamics of cities and regions” and help to uncover “how inequalities in and between places are established and maintained.”¹³ The powerful forces in cities, perennially in pursuit of higher exchange values, are a part of what Logan and Molotch deem the Growth Machine, which “...takes a toll on use values - how well people live.” They note, “When those in control are preoccupied with exchange value goals, the likelihood of success on other fronts is greatly diminished.”¹⁴ Those searching for exchange values nearly always get their way, which is what diminishes the chance that cities reflect the needs and desires of the majority. This is not to say the Growth Machine is inevitable: residents and organizers can fight back. But Logan and Molotch emphasize: “Governments Matter.”¹⁵ The lens through which local agencies view their responsibility to the public can have a significant impact on the outcome of the urban form.

Logan and Molotch propose that distributive effects of urban projects are vital to consider: the effect on quality of life and access to jobs, housing, and other resources for different people (by neighborhood, by ethnicity, by social class) should be key components of

¹² Logan and Molotch cite Marx with the original formulation of the distinction between use and exchange values but note the differences between their framework and a strictly Marxian view of cities. The authors attempt to “view location as a fundamental material attribute of human activity but recognize that location is socially produced.” A focus on the local - and the multitude of actors involved - help them to build upon the idea of urban form as simply a result of class conflict.

¹³ Urban Fortunes, 2.

¹⁴ Ibid, xi.

¹⁵ Ibid, 147.

any project.¹⁶ But it is difficult to account for the distributive, long term effects of an investment in public transit. How is a more well-connected, equitable, and environmentally stable city measured? The answers to these questions can become secondary considerations, especially when the use value of a project is not the focus. Typically, exchange value is prioritized, which limits the potential of projects that emphasize the impact on use value. Public transportation, a good that is entirely about use value, will struggle in any city when this dynamic occurs.

Much of this is due to the cost-benefit analysis framework that is commonly used when assessing projects. In recent years, some economists have highlighted what is captured by this framework - and what is left out. It is clear, when understanding how most government agencies view funding projects, that the bottom line is the most important component. The cost-benefit framework has become the most widely used for measuring the effectiveness of investment. But the model makes assumptions that dollars and cents can capture a societal good. In an effective critique of this assumption, environmental economist Frank Ackerman provides a series of reasons why the logic of maximizing monetary benefits and minimizing costs falls short of encapsulating the needs of society. This includes, for example, “pricing the priceless” and distorting the future. Attempting to assign a dollar value to things that cannot be quantified, and miscalculating values that will be gained or lost years down the road, respectively.¹⁷

Furthermore, the cost-benefit approach is unable to capture the intangibles of an equitable society, as was noted in a 2014 British transportation review that emphasized a social justice approach to planning:

“Collectivist approaches are based on principles of equality, fraternity and freedom, which translate into a search for equity of outcomes. It is not easy to translate these doctrines into policy

¹⁶ Ibid, xxi.

¹⁷ Frank Ackerman, “Critique of Cost-Benefit Analysis, and Alternative Approaches to Decision-Making,” *A report to Friends of the Earth*, January 2008.

and objective measures of the deserving or needy. The dominant mode of decision making within transport planning (based on rational man, quantitative, and utility maximizing approaches) may act as a hindrance to social justice within transport. In this context, current modelling and appraisal systems tend to reinforce the status quo.”¹⁸

There have been many critiques of simple cost-benefit ratios and the way they are utilized to address problems facing cities. It is easiest to understand this by looking at social issues or distribution impacts. These impacts can only truly be measured qualitatively and are therefore excluded in cost-benefit analyses. Removing any impacts that can only be measured qualitatively seems preposterous, but by treating them as secondary considerations and excluding them from the primary mode of analysis, that is effectively what happens. While there have been attempts to measure some of these effects quantitatively, there is no agreement between economists that these are compelling modes of measurement.¹⁹ The lack of consensus makes it easier to leave those considerations outside of the analysis. In the following chapter, I will show how Boston built its first subway, a project that was reliant on the belief that the future of the city was more important than the immediate costs.

¹⁸ Titheridge et. al, 5.

¹⁹ See Bocarejo and Oviedo, 2012 for more on measuring social equity through stated preferences.

Chapter II: “The Cost Must Be Great”

In the early 1890s, downtown Boston had a serious congestion problem. The population of the city and the surrounding suburbs had exploded since the middle of the century, and since streetcars had not yet been electrified, the growing population relied on nearly 8,000 horses to meet their transportation needs each day.²⁰ This left the streets in complete mayhem. The layout of the city was already centuries old at that point and lacked sensible planning to accommodate the rapid growth. The *New York Times* noted Boston’s inferiority in a 1892 article regarding public transit: “Everybody who has studied the history of the town is aware that its early streets were constructed along the lines of the cowpaths that wound their serpentine ways among the three hills and the intervening valleys.”²¹ The city certainly reflected this antiquity: Tremont street, for example, ranged from 33 to 62 feet wide as it cut through the highly congested business district.²² There was broad agreement that a solution to mitigate the congestion was necessary, but it was unclear what form this solution would take. The plans for an elevated rail, proposed as early as 1881, were deemed too expensive.²³ It wasn't until a decade later, when conditions downtown were close to unimaginable, that considerable progress was made in the movement towards better transportation.

Until 1891, private interests drove the development of mass transit. While there were several companies established in the city with tracks and trolley routes, a few especially powerful owners had massive control over transit in the area. Just three years after founding the

²⁰ Steven Puleo, *A City So Grand: The Rise of an American Metropolis, Boston 1850-1900* (Boston: Beacon, 2011), 218.

²¹ "Boston rapid transit," *New York Times*, April 6, 1892, 10.

²² "Letter to the editor: Question of rapid transit," *Boston Herald*, February 13, 1893, 5.

²³ Committees Massachusetts General Court, Hearing in the matter of the elevated railroad, opening argument and evidence on the petition of Joe V. Meigs et al., 1881.

West End Street Railroad Company in 1888, industrialist Henry Whitney managed to consolidate five separate companies, giving him ownership of over 200 miles of tracks in the city. His immense merger efforts were not without controversy, but he made a compelling case for an efficient system. This merger, he claimed, was for the benefit of the people. “I believe this company is destined to play a very important part in the lives of this whole community,” he said after the consolidation. “We believe that we can do something for the comfort and happiness of these people that we could not do as individual corporations, and I am deeply sensible of the responsibility which rests upon us to do it.”²⁴ His message was well-received: private companies had successfully provided transportation for the residents of the Boston area in the past. However, as Boston continued growing, it became clear that streetcars alone would not solve the congestion problem. During rush hour, the streetcars would inch along, literally bumper to bumper, for over a mile in the center of Boston. Because of the partial monopoly over the streetcar network, West End Street saw huge profits and consistently high returns for its investors. While his initial message had called for comfort and happiness, Whitney was not beholden to this promise, and he was able to rake in the profits as congestion continued.

It became clear that a larger scale solution was necessary, and while the transit companies had provided consistent growth in the network of streetcars, larger projects such as elevated rail lines and subways were not seen as profitable endeavors. Whitney refused to pursue these ventures given the risk that such a large project posed. This dilemma was evident to Nathan Matthews and his election as mayor in 1891 marked an important moment for the future of public transit in the city.

Matthews entered office with a straightforward message: clear up the congestion and ensure that all residents of Boston had comprehensive access to the city center. In his inaugural

²⁴ Louis P. Hager, “History of West End Street Railroad Company,” (Self-Published, 1892), 29.

address, Matthews emphasized the need to reclaim the streets of Boston from Whitney and put the power back in the hands of elected officials.²⁵ “I believe the city government should grapple with this problem, rather than leave the matter entirely to the interest and action of private interests,” Matthews said in the address.²⁶ He understood the limits of private investment, and emphasized the need for a government that could look for solutions to the city’s problems in a representative fashion. His zeal for public investment in transportation gave him unbridled determination to solve the congestion predicament.

Nathan Matthews was a public entrepreneur, undeterred by naysayers.²⁷ His first step towards a better transit system was requesting that a transit commission be formed to investigate the problem and offer a solution. The commission would be focused on solutions that catered to citizens, not simply the profitability of the transportation sector. “The main need of Boston,” Matthews proclaimed in the address, ‘is greater powers of self government.’²⁸ Within his first year, Matthews assembled the Rapid Transit Commission, and after 10 months of extensive research, they presented their findings to the City Council and the Governor on April 5th, 1892.

The Commission set far-reaching goals for the future of transit in the city in a 250 page report. The report included detailed descriptions of the commission's findings, as well as building plans, budgets, and projected outcomes for a number of projects. Furthermore, the report proposed a subway that would relieve the city center from congestion; a plan completed only in London, Budapest, and Glasgow.²⁹ The commission went to great lengths to defend its findings

²⁵ Doug Most, “The Race Underground,” (New York: St. Martin’s Press, 2014), 55.

²⁶ “Mayor Matthew’s Address,” *Boston Globe*, Jan 6 , 1891.

²⁷ Kenneth Shepsle and Mark Bonchek define a public entrepreneur as an elected official who “...sees a prospective cooperation dividend that is not currently being enjoyed...” and is willing to take a political risk to pursue it - which is a vital component of nearly all successful public good projects. See Shepsle and Bonchek (1997) p. 245-246.

²⁸ “Mayor Matthew’s Address,” *Boston Globe*, Jan 6 , 1891.

²⁹ Puleo, 226.

by predicting opposition and making convincing counter arguments. They acknowledged the implementation would be difficult, but they explained in the report the long term impacts their plan - and specifically the subway - would have. The joint report ended in this profound summary:

We have sought a cure which, if radical, is yet permanent and thorough and complete. If others complain that its cost is intolerable, we answer that delay will not diminish it. Such as it is, it must stand or fall upon its merits or demerits as a whole, after a fair canvass. For ourselves, we do not desire to deprecate criticism, nor to shun the most searching scrutiny. The problem is exceedingly important; upon its solution depends the future of Boston and its suburbs; and it deserves deliberate and careful treatment. We frankly admit that the cost must be very great; but we are satisfied that no really effectual remedy can be had for much less, and we believe that the financial difficulties are not insuperable...The plan which we submit may be too onerous to be taken in hand at once, or it may be deemed wiser to proceed step by step and piecemeal; but we are convinced that if anything is to be attempted the work should be done upon some far-reaching and well-digested plan, and with a steadfast adherence to a fixed course and definite policy. If anything is to be undertaken, let it be ample and thorough and complete in its kind. Short of that, it were wiser to stand still where we are.

Respectfully submitted,

Nathan Matthews, Jr.

John Quincy Adams.

Chester W. Kingsley.

Osborne Howes, Jr.

Henry L. Higginson.

James B. Richardson.

John E. Fitzgerald.

William Jackson.³⁰

The report struck a chord with many of the representatives from around the Boston area. It effectively proposed a long-term solution to a problem ailing so many Boston residents. The

³⁰ Massachusetts Rapid Transit Commission, 1892. *Report of the Rapid transit commission to the Massachusetts legislature: April 5, 1892*, 105-106.

message from the Commission was clear: the undertaking would be well worth the time and resources put in.

However, a well written report could only do so much. There was still substantial resistance to the subway and the other ideas laid out in the report. There was resistance from businessmen: a petition stating opposition towards tearing up the streets during construction of the subway gathered over 12,000 signatures after the report was published.³¹ There was resistance from religious folk who thought that going underground was going closer to the devil and the air would be unsafe to breathe.³² Lastly, people were concerned that the subway would encroach on the Boston Common, a sacred part of the city that no one wanted touched.³³ The debate dragged on. After over a year of hearing arguments from both sides, Matthews made his case in front of the Commission. In it, he addressed every argument that had garnered a following and attempted to dispel beliefs that a subway would do anything but help the city in the long run. Matthew's promised that the Common would remain intact and explained to the businessmen that clearing up congestion would help them in the long run. The *Boston Globe*, which printed 6 pages of his entire remarks, ran the headline: "*Now the Time: People Want Action on Public Transit, Nothing More Gained By Delay.*"³⁴ When it went to a popular vote only a few months later, the margin of victory was razor thin.³⁵ Those who voted 'no' expressed concerns of the unknown, and claimed that since just under 30,000 people voted (a relatively small percentage of Boston residents), there should be a revote.³⁶ But Mayor Matthews was

³¹ "Against Subway: Merchants League is Solidly Arrayed," *Boston Globe*, 30 April, 1894.

³² This was an argument that gained traction around the city. The pastor of the Park Street Church called the subway "an infernal hole" and "an un-Christian outrage," claiming the devil was behind the plan. (See Clarke and Cummings, 1997).

³³ Most, 150.

³⁴ "Now The Time," *Boston Globe*, April 6, 1894.

³⁵ "Rapid Transit In Boston," *Boston Globe*, July 25, 1894.

³⁶ Ibid.

already moving forward with the plan. After years of debate, Boston was making progress towards a modern transit system.

The growth of public transit

It was not until three years later, after the Tremont Subway had opened to the public, that the investment in technology proved popular among Bostonians. While there were a few delays during construction, including a gas explosion that killed 10 people, the pessimists were nowhere to be found on September 1st, 1897. Swarms of people gathered at 6:00am to watch the first train make its way underground, which the *Boston Globe* excitedly reported as the “First Car Off the Earth,” even though Boston was only the first city in America to complete the subway. Between 200,000 and 250,000 people rode the subway on its first day to experience the “...ease and speed with which hitherto snaillike trolleys now glide through the underground passage.”³⁷ It was a remarkable and exciting day for Bostonians.

The progressive advance in transit commanded respect. The *New York Times*, unusually positive, wrote an article commending the achievement: “That so conservative a town should happen to be the pioneer in adopting [a subway] is viewed as remarkable.”³⁸ In just over five years, Boston had gone from the city known for its windy streets and overbearing congestion, to touting America’s first subway. With creative planning and efficient public investment by elected officials, Boston had solved one of its most persistent problems.

The completion of the subway set a precedent for what public transit could look like in other cities across the country at the turn of the 20th century. On the day it opened, a *Boston Globe* journalist excitedly claimed, “Boston’s experiment in subway construction has been

³⁷ “Every Car Crowded,” *Boston Globe*, September 2, 1897.

³⁸ “Boston’s impending Opening of America’s First Subway,” *New York Times*, August 15, 1897.

watched with a great deal of interest elsewhere. Its success will mean setting the pace for Greater Gotham, not to mention many smaller cities in our land.”³⁹ The city reveled in the fact that it was creating a legacy of bold investments. The pride from the commission’s first undertaking quickly led to additional projects.

South Station was one such project. In perhaps the second most significant transit project of the decade, Mayor Matthew’s successor, Josiah P. Quincy, urged the New Haven Rail and Boston & Albany companies to consolidate their separate terminals into one station. There were major inefficiencies in having separate depots in the same area, and with Quincy’s prodding, the companies worked together to solve them. Along with a few affiliate companies, New Haven and B&A replaced four separate depots with what would soon become the most trafficked station in the world. The grand station covered 35 acres and had 28 separate tracks for incoming trains.⁴⁰ The consolidation helped streamline arriving trains and clear up much of the unnecessary space being used for track storage by the individual companies around the city. But the station was not only efficient. It was the largest station in the world when it opened, towering 135 feet above the busy streets and stretching over 850 feet across multiple blocks.⁴¹ The stunning neoclassical architecture made it one of Boston’s most prominent structures. In an address following the completion of South Station in 1899, Mayor Quincy remarked, “South Station will be a source of pride to its citizens, an object of admiration to strangers... Narrow-minded men would not have been able to comprehend the problem, timid men would not have dared to assume the necessary responsibilities. It is because those connected with this enterprise were types of New England character...that this station stands here today.”⁴²

³⁹ “Now for the Subway,” *Boston Globe*, September 1, 1897.

⁴⁰ Kevin J. Holland, *Classic American Railroad Terminals* (Boston: MBI Publishing, 2001), 30.

⁴¹ Puelo, 254.

⁴² “South Station Opens,” *Boston Herald*, January 10, 1899.

In the following years, Boston continued to add to the network of mass transit, including three additional tunnels that took passengers closer to the suburbs without interfering with above ground infrastructure. A decade after South Station's completion, Boston's public transit system was thriving - so much so that the owners of South Station began to worry about the station's capacity. They looked for solutions, including underground storage or a tunnel to solve this impending problem. The dilemma was that South Station was a terminus, so trains were unable to continue through which slowed down the entire station. If this problem could be mitigated, the station's capacity would be greatly expanded.

Furthermore, by 1910, North Station and South Station were two of the busiest hubs in the country, but they still lacked an easy connection. Only by leaving the station and taking the Atlantic Avenue Elevated Line could one travel between them.⁴³ Without a connection, trains were not able to continue through the city, making it difficult for any company to efficiently run trains both north and south of Boston. But given the privatized nature of transportation, it was unclear who would take the lead on such a project.

⁴³ Cudahy, Brian. *Change at Park Street Under: The Story of Boston's Subways* (Brattleboro: The Stephen Greene Press, 1976), 25.



“Approach tracks and train shed of South Station in Boston, Massachusetts in 1904”, Detroit Photographic Co. Accessed from <https://www.south-station.net/historic-photos/>

Making the connection

In 1910, New Haven Railroad president Timothy Byrnes sat at the back of a meeting between the members of the Legislative Committee on Metropolitan Affairs. He had asked for a chance to speak, but after a while he did not think he would be offered the opportunity. As he put on his jacket and headed for the door, a voice called out, asking if he no longer desired to express his views.⁴⁴ He made his way to the front, carrying prepared remarks, and got straight to the point. “The railroads wish for a tunnel,” Byrnes said, “...and if the city will pay for the land damages for the proposed street the railroads would be willing to build the [tunnel] and pay the city \$2,000,000 for the subsurface rights.”⁴⁵ The proposed street, which the Committee had

⁴⁴ “Byrnes Urges Tunnel Plan,” *Boston Globe*, 8 March, 1910.

⁴⁵ *Ibid.*

already recommended as an above ground connection in the city, posed an opportunity for the company and the city to work together.

The New Haven Railroad Company had a vested interest at this point: the company was in the process of a merger with a railroad in Maine, so the link would enable maximum efficiency for their lines.⁴⁶ Its investors saw potential in the Northeast Corridor and were ready to provide capital to see a connection. Byrnes continued to explain to the committee what the plan would entail before noting that the railroad would be willing to pay for the entire tunnel; a cost estimated at \$16 million.⁴⁷ Furthermore, he explained why the company jumped at the opportunity: “There is very little trade between northern and southern New England, and we hope to move much of the freight.”⁴⁸ This was well-received by the committee who agreed there was “great need” for a better connection, but Byrnes was carefully diplomatic. “We are ready to go on with this project,” he said, “but we don't want to push it at the expense of anybody's feelings. We simply want to see the freest interchange of traffic between the north and south districts.”⁴⁹

While Byrnes spent ample time lobbying legislators, he also worked to build a coalition of businessmen. A few days after meeting with the Metropolitan committee, he told the Boston Credit Men's Association, “I do not believe the way to make Boston bigger and busier is to make it hard to get into, hard to get out of, and hard to get through.”⁵⁰ His advocacy emphasized that this connection would be beneficial to all. He continued, “These interests are your interests...we

⁴⁶ Barnico, Thomas, “Brandeis, Choate, and the Boston & Maine Merger Battle, 1903 - 1914,” *Massachusetts Legal History*, Vol. 3, 1997, 125.

⁴⁷ “Byrnes Urges Tunnel Plan,” *Boston Globe*, 8 March, 1910.

⁴⁸ *Ibid.*

⁴⁹ *Ibid.*

⁵⁰ “Railroads Want to Help,” *Boston Globe*, 16 March, 1910.

want to help you develop New England's commercial possibilities."⁵¹ This intense push for the tunnel plan showed the potential - at least from the private sector's point of view - for a link in Boston.

The support from New Haven Railroad, however, only lasted so long. The company - whose main investor was J.P Morgan - was charged for conspiracy to monopolize interstate commerce in 1912.⁵² The trust suit filed against them accused the company of owning "...an illegal monopoly of practically all the transportation avenues that penetrate New England."⁵³ This included nine out of 10 railroads, 22 of the 30 boat lines, and almost all of the trolleys in the region.⁵⁴ There had been resentment towards big industry, especially the railroads, since the late 19th century. The passage of the Sherman Act in 1890 gave the courts unprecedented power to regulate industry and the first decade of the 20th century saw a series of decisions blocking private expansion. In this particular case, Judge Louis Brandeis, who was already considered a top lawyer in the fight against corporate consolidation (particularly in the transportation industry) led the fight against New Haven Railroad.⁵⁵ Since New Haven Railroad was the largest company in Boston with a stake in transportation, this turn of events stalled the tunnel's undertaking.

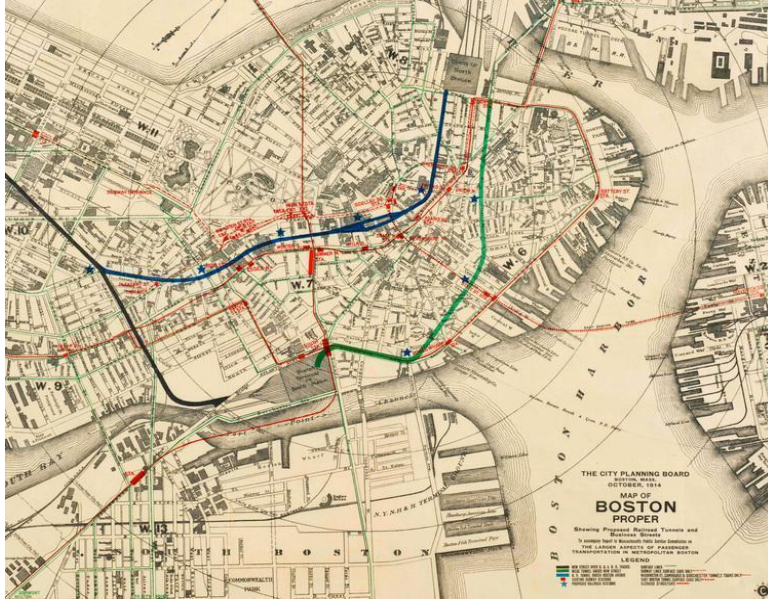
⁵¹ Ibid.

⁵² "Indict 21 in Deals of The New Haven," *New York Times*, 3 November, 1912.

⁵³ Boston Globe, "*Trust Suit Filed to Dissolve New Haven System*," 24 July, 1914.

⁵⁴ Ibid.

⁵⁵ Barnico, 126.



Map of proposed railroad tunnels in downtown Boston (October, 1914)
Boston Public library, Accessed from <http://northsouthrailink.org>

In the years after New Haven’s suit, the Boston City Planning Board acknowledged in a report the weakness of the current system and its “...failure to deliver passengers from opposite sides of the city to their destinations in the business districts.”⁵⁶ Furthermore, while Boston had undertaken many public-private partnerships in forging its renowned transit system, elected officials began to think that such a vital link in the city would be better off if the city was in control. They wanted to ensure that planning was handled with the proper benefits in mind.⁵⁷ The Planning Board fully realized the problem that New Haven Railroad wanted to solve, which they referred to as “a terminal problem.”⁵⁸ But it was a problem they wanted to mitigate for the sake of the public, not simply for the fulfillment of a monopoly.

In their report, the Boston City Planning Board made it clear that a private entity controlling such a vital piece of infrastructure was risky: “Past experience in many states leads to the fear that any terminal corporation which might be created to take over all existing

⁵⁶ Boston City Planning Board, *Report: City Document no. 7*, 1914, 8.

⁵⁷ “New Route in Boston,” *Boston Evening Transcript*, January 30, 1911.

⁵⁸ *Ibid.*

transportation properties in metropolitan Boston would be of such tremendous importance as to overshadow the state.”⁵⁹ While acknowledging that private corporations would greatly assist the project’s completion, the Board questioned whether the motives would become skewed. “[It is unclear] if it would be wise to allow a private profit to be made out of a service of such crucial importance to the community,” the report stated.⁶⁰ The Board knew the link was necessary, but they did not trust a corporation to take on such an important task.

Instead, the Board made a case for public funding, which explained that this project was part of a larger vision for the city. The project would not simply be for the derivation of profit, but to help build a comprehensive transit system for citizens to utilize:

“The only hope of any substantial and effective immediate relief [from congestion] is by a thorough and fundamental consideration of the whole Metropolitan transportation problem. We are too much in the habit of thinking in terms of details; we need broad and courageous planning of great things, such as resulted in the construction by the city of Boston of the first of those subways which are proving the solution of the transit problem in great cities.”⁶¹

This message, however, was only a recommendation. The Board was responsible for addressing the needs of the city, but their powers only went so far. Their final proposal was to hold a referendum and let the public decide.

But the vote would never come to fruition. In House Bill No. 382, the Massachusetts Legislature called on the Rapid Transit Commission, still going strong over 20 years after it was founded by Mayor Matthews, to study the costs and benefits the link.⁶² In their 1914 report, the Commission laid out their findings, expressing disappointment: the costs were much greater than they had originally thought.⁶³ Since construction would be done by the city, it would need to invoke eminent domain over the elevated rail (owned by Boston Elevated Railway Co.) and pay

⁵⁹ Ibid, 9.

⁶⁰ Ibid.

⁶¹ “Ownership By State Urged,” *Boston Globe*, Oct 21, 1914.

⁶² Massachusetts House of Representatives, *Bill No. 382*, 1913.

⁶³ Rapid Transit Commission, *Twentieth Annual Report*. June 30, 1914, 76.

damages for doing so.⁶⁴ Additionally, the building of the tunnel would include the destruction of property along the route, and there would have to be damages paid for that as well. All told, the new cost estimate for the project would be \$8,920,500.⁶⁵

After laying out the costs, the Commission also explained the benefits, breaking them down into three parts: “First, from increased value of land now used which would be released or made more valuable; second, by the increase in real estate values and tax returns; third, by betterment assessments imposed upon abutting property.”⁶⁶ However, the benefits were summarized in less than a paragraph, while the costs had taken two pages plus a series of charts to explain. The Commission, while recognizing that subways were preferable, did not see the undertaking as worthwhile. They recognized that the benefits were great but could not justify such a large expense.⁶⁷ While the idea had peaked the Legislature’s interest, the points put forward by the Rapid Transit Commission outweighed the wishes of the Boston City Planning Board.

This would be the first of many arguments against the North South Rail Link that would emphasize the bottom line and gloss over the numerous benefits. And since private interests were no longer involved to push for such an expensive undertaking, it would be a long time before Boston would even debate the topic as a legitimate idea. Cars were about to take over the landscape and the next decade saw the beginning of the end for the public transit boom. While Boston had begun the 20th century with massive investment, it faded almost completely by the 1930s. World War I was the last hurrah for mass transportation, as Boston served as one of the busiest hubs during the war. But by the time war ended, there was already a societal shift

⁶⁴ Ibid, 79.

⁶⁵ Ibid.

⁶⁶ Rapid Transit Commission, *Twentieth Annual Report*. June 30, 1914, 80.

⁶⁷ Ibid, 84.

towards the automobile. The post war economic boom and the decreasing cost of the Model T made cars affordable for the average American: in 1909, Ford sold 4,192 vehicles. In 1920, it sold 1.9 million.⁶⁸ This increase in car ownership did not at first mean a decrease in transit for the nation's largest cities, and Boston still boasted one of the highest rates of trips by transit at the end of the 1920s (76%).⁶⁹ But ridership could only last so long without continued investment. The excitement over car ownership replaced the excitement towards recent technology in subways that had been widespread only a few decades prior. These factors combined to make the decline of transit almost inevitable, and the automobile began its reign of dominance over the transportation landscape.

⁶⁸ Sean Cashman, "America Ascendant: From Theodore Roosevelt to FDR in the Century of American Power, 1901-1945," (New York: New York University Press, 1998), 54.

⁶⁹ David Jones, *Mass Motorization and Mass Transit* (Bloomington: Indiana University Press, 2008), 54.

Chapter Three: A New Era for Transit

Exactly 60 years after the first failure to establish the North South Rail Link, Massachusetts elected a pro transit governor with a passion for bringing sustainable transportation back to the Boston area. But in the time between 1914 and 1974, the entire landscape of American transportation had changed. By the time Michael Dukakis arrived in office in 1975, cities looked nothing like they had in the first quarter of the century and driving across the country took about one tenth of the time. In this chapter I will give an overview of the automobile's effect on the American landscape and how it dramatically changed public investment, especially in Boston. I will outline legislation, heightened by war-time sentiments, that helped to cement the current transportation systems the country has in place today, before explaining how that very legislation set the stage for the anti-highway movement and Michael Dukakis' governorship. It was during his second term that the NSRL was brought back to life, only to fail a second time. Understanding the rise of the automobile industry can help inform how public perception of government investment changed. The power dynamics shifted and federal funding took on a big role in shaping infrastructure on the urban level. It was only after decades of pursuing a car-centric vision that residents were successful in pushing for their idea of what a city should look like.

“God's Great Open Spaces”

The popularization of automobiles in the first two decades of the twentieth century helped to create the perfect storm for rail transit across the country to begin a downwards spiral. The mass consumption of the Model T helped to create demand for roads, which created a larger

market for cars. In turn, this helped to generate political pressure to satisfy the demand. It was an unstoppable circle of growth. Suddenly, the automobile culture had transformed the government's role in infrastructure investment. There were a mere 161,000 miles of surfaced roads in the country in 1905, much of which was provided by state and local governments. The total shot up to 521,000 miles in 1925 during a postwar boom when car ownership spiked. Power over roads went from local to state to federal government in a matter of years, and by the time New Deal programs had ended there were 1,721,000 miles across the country.⁷⁰ While there had been an increase in local and state spending on roads in the early part of the century, the New Deal was the first time that the federal government became intimately involved with the building of roads and highways. The New Deal spread funding to a range of infrastructure projects - including a \$77 million loan to help the Pennsylvania Railroad electrify its New York to Washington line - but most of the spending was on roads, airports, utilities, and national parks.⁷¹ None of the funding went to urban rail or trolleys.

The government's investment in highways reflected a shift in the public attitude towards transportation. The rise of the automobile forced the government's hand: prior to the demand for roads, transportation such as railroads had been heavily supplied across the country by private companies. Now, it was up to the government to not only regulate transportation but provide most of the infrastructure for it. This transition occurred as railroads were declining, being charged for monopoly behavior, and becoming more and more obsolete. Progressives and reformers took advantage of the railroads weakening power - what had once been the most influential industry in the country - to advocate for a stronger government. Railroads had

⁷⁰ Cashman, 55.

⁷¹ New York Times, "*P.R.R Will Spend \$77 million at Once*," 31 Jan, 1934.

dominated the political landscape for many years, but they were seen as abusing their power, and there was popular support for curbing it.⁷²

Automobile companies jumped on this opportunity. They served as a symbol of freedom, and Henry Ford drew on this sentiment to popularize his brand: "I will build a car for the great multitude. It will be constructed of the best materials...but it will be so low in price that no man making a good salary will be unable to own one—and enjoy with his family the blessings of hours of pleasure in God's great open spaces."⁷³ This marketing worked extremely well as the country looked for an alternative to the dominant railroads, and the government was forced to take on a new role. Transportation infrastructure had become a personal right and a government responsibility.

The investment in roads continued after the New Deal funding had dried up. On April 27, 1939, President Roosevelt recommended that Congress consider action on, "[A] special system of direct interregional highways, with all necessary connections through and around cities, designed to meet the requirements of the national defense and the needs of a growing peacetime traffic of longer range."⁷⁴ Roosevelt's concern for wartime connection throughout the country - along with his vision for postwar America - helped to further the already well established highway system that had grown throughout the 30s. However, it was not until Dwight Eisenhower won the presidency that highways would be forever cemented as the backbone of the

⁷² H. Roger Grant, "Railroaders and Reformers," *State Historical Society of Iowa*, 1991.

⁷³ Robert Casey, *The Model T: A Centennial History*, (Michigan: Johns Hopkins University Press, 2009), 77.

⁷⁴ Richard Weingroff, "Federal-Aid Highway Act of 1956: Creating the Interstate Highway System," *Public Roads Vol. 60*, 1996.

American transportation system.⁷⁵ In 1956, Congress authorized a new highway system with the help of President Eisenhower by passing the National Interstate and Defense Highways Act.

The Act put an unprecedented \$25 billion of federal funds towards super highways over 10 years.⁷⁶ The federal government had been increasing its investment for years, but this act fundamentally changed the way the government funded transportation projects. It was done in a sweeping gesture that would alter the landscape of the country forever. Eisenhower reflected on the Highway Act as his favorite domestic policy. In his memoir he wrote, “More than any single action by the government since the end of the war, this one would change the face of America...its impact on the American economy was beyond calculation.”⁷⁷ This was a massive piece of legislation, extending the federal government’s reach into a vital aspect of every state’s transportation network. It was viewed as beneficial for everyone. As one journalist wrote, “To the motorist, the Interstate System will be a dream come true; to the Federal Government it will mean a correction of an Achilles heel in our defense.”⁷⁸ However, the love of automobiles and the promise of a highway system that could cure all transportation ills could not last forever.

⁷⁵ Eisenhower’s first realization of the value of good highways was in 1919, when he participated in the U.S. Army’s first transcontinental motor convoy from Washington, D.C., to San Francisco. After 62 days on the road, the convoy reached San Francisco, where it was greeted with medals, a parade, and more speeches. Eisenhower also saw the benefits Germany enjoyed because of the autobahn network during WWII. An expansive highway system was always a part of his plan for the country.

⁷⁶ Federal Highway Administration, “Dwight D. Eisenhower national System of Interstate and Defense Highways,” Updated February 1, 2018.

⁷⁷ Weingroff.

⁷⁸ Charles B. Seib, *The Road Ahead* (New York, H.W. Wilson, 1957), 178.

Disrupting the Urban Fabric

The 1950s and 60s witnessed an unprecedented number of urban projects that were highly disruptive of the urban fabric.⁷⁹ First, federal funding gave cities immense power to rebuild parts of the metropolitan area from scratch. Beginning with the Housing Act of 1949, the federal government would help pay for new housing in any area that was deemed a “slum,” making it extremely attractive for cities to simply get rid of any ‘questionable’ neighborhoods. This act had larger implications, serving as a symbolic undertaking to reshape urban policy.⁸⁰ Part of the Cold War strategy was to ‘win the war at home’ by promoting freedom through culture. ‘Slum clearance’ became a large part of this strategy: “Across the United States, the term came to be understood, by both its proponents and its critics, as symbolic of the way that planning and architecture were remaking the daily lives of city-dwellers.”⁸¹ Slum clearance put incredible power in the hands of a few powerful elites in each city, many of whom used the opportunity to push the Growth Machine to new levels.⁸²

Robert Moses, infamous for his destruction in New York city, did not mince words on the matter of city planning: “You can draw any kind of pictures you like on a clean slate, but when you operate in an overbuilt metropolis you have to hack your way with a meat ax.”⁸³ Local governments ate up the funding, specifically targeting lower income neighborhoods and razing entire sections of the city so they could do with it what they pleased. Across the country, powerful actors such as Moses were literally clearing the way for private interests to swoop in and make a sizable profit. Suddenly emboldened by federal funding and legal power, these

⁷⁹ Alan Altshuler and David Luberoff, *Mega-Projects: The Changing Politics of Urban Public Investment*, (Washington, D.C.: Brookings, 2003), 219.

⁸⁰ Samuel Zipp, *Manhattan Projects: The Rise and Fall of Urban Renewal in Cold War New York* (New York, Oxford University Press, 2010), 8.

⁸¹ *Ibid.*

⁸² *Ibid.*, 245.

⁸³ *Ibid.*

people took full advantage of the moment to reshape the urban form in pursuit of higher rents and ‘modernization.’ The Highway Act helped further the trend of slum clearance, providing additional opportunities to continue the demolition of ‘unwanted’ parts of cities.

This was especially true in Boston. In the 1950s, as former state Transportation Secretary and highway activist Fred Salvucci describes it, “There was a ‘you can’t fight City Hall attitude.’”⁸⁴ The concentrated power in Boston was often abused at the expense of lower class residents throughout the city.⁸⁵ Many of the historic neighborhoods around the city were seen as relics of the past, too dirty and too dense for proper living. Clearing out these spaces to create ‘bigger and better’ housing was the easiest and most profitable solution. If a neighborhood survived slum clearance, it could be bookmarked for demolition the following year when additional highway funding was received.

The expansion of highways through urban areas left public transit almost completely dried up. Localities were more concerned with securing federal funding and expanding their road capacities than figuring out ways to keep transit systems above water: “Most American cities welcomed the state and federal funding for the metropolitan freeway construction that began to flow in the late 1950s, and they shied away from the more difficult tasks of rethinking how transit is financed and rationalizing how transit service is provided.”⁸⁶ Since all of the wealthiest and most powerful interests in cities were in favor of this demolition, there was no need to justify the lack of transit.

⁸⁴ “Interview with Fred Salvucci,” *PBS: Great Projects, The Building of America*, 2002.

⁸⁵ *Ibid.*

⁸⁶ Jones, 101.



The first Central Artery being built in Boston in the late 1950's. The existing buildings in its path were demolished. Accessed from Boston Public Library, Print Department; photograph by Leslie Jones.

Renewing a Vision of Public Transportation

This period in American history was extremely destructive to urban areas, harming especially immigrants and minorities, but the effects helped to spark a backlash of large scale activism across the country. By the late 60s, there was a realization that marginalized communities were at risk across the country and organizing began to form in response to the harmful projects. The poorest people in cities were being kicked out of their homes and given

only partial compensation; many of the immigrants being removed did not even speak English.⁸⁷ In Boston, the inner belt highway was proposed as part of the interstate highway system. The plan was drawn up so that it would pass through Jamaica Plain, Roxbury, the South End, Cambridge, Somerville, and East Boston.⁸⁸ This was not the first proposal for a highway through the urban core, but it acted as a tipping point. Residents throughout the city joined to create a united and powerful force. The movement culminated with a yearlong battle in 1970, which ended when Republican Governor Frank Sargent went on television and announced a moratorium on all new highway construction within Route 128. It was a complete reversal of policy from Sargent, who was breaking from a trend set by previous administrations. This marked a turning point for the city of Boston: it was the first major victory for grassroots activists working to ensure the city would not prioritize another highway at the expense of its citizens. Sargent's decision and the activism that spurred his speech were instrumental in the future of city planning. It was a new chapter for the future of mass transit around the country.⁸⁹

Sargent's decision was remarkable for a number of reasons. He was one of the first public officials in the country to admit that highways were not the future of cities. After helping secure funding and further the reach of the automobile for over a decade, he came to the conclusion that he was wrong all along. Additionally, by stopping the highway plans he was forfeiting over \$700 million⁹⁰ in federal funding, alienating many powerful interests in Boston. Alan Altshuler, Sargent's Transportation Secretary, explained the motivations behind this move: "This was not because Sargent thought that highways were declining in value in terms of economic development. In fact, the business community was furious about his decision to skimp on

⁸⁷ Salvucci Interview.

⁸⁸ Ibid.

⁸⁹ Steven Kaiser, "The Inner Belt," *Cambridge Historical Society*, October 14, 2017.

⁹⁰ \$4.5 billion in 2018 dollars.

highway investments. But Sargent believed in his decision, and hoped that gains in the environmental, minority, and generally anti-highway groups would offset the loss of business leaders.⁹¹ This was a quite simply an act of defiance. Sargent's vision for the city - which was certainly shaped by the anti-highway activists that had been making waves - did not line up with the special interests that stood to profit from the status quo of slum clearance and additional highways. In pursuing a reversal of transportation policy, he was risking his political career.

After announcing the moratorium, Sargent began aggressively advocating for federal legislation that would allow Massachusetts to receive funding for projects that aligned with his transit goals. There was precedent for giving funding to states which had cancelled projects in the past, and Sargent argued that the current state of Boston was not conducive to a new highway. There was funding set aside for Massachusetts' highway proposal at the time, but with the help of Majority Leader Tip O'Neill, Massachusetts was able to help create the 'interstate transfer' provision of the Highway Act of 1973.⁹² Eventually, Massachusetts received \$1.46 billion in special grants for mass-transit investment. This act had a profound effect on the anti-highway movement that was already gaining steam. Grassroots organizers had struggled to build enough support to stop local projects that could receive federal funding, since it was essentially turning down free money. The interstate transfer helped cities look for alternative projects and opened the door for federal funds to go towards public transit. In the quarter-century after 1973, federal Interstate Transfer grants totaling \$6.83 billion were distributed to 23 metropolitan areas.⁹³ In Boston, the funding helped to relocate the Orange line, provide the Orange and Blue lines with new equipment, and help refurbish the commuter-rail network. Instead of running a

⁹¹ Alan Altshuler, "Massachusetts Gov. Sargent: Sarge in Charge." (Journal of State Government, 1989), 153.

⁹² Federal-Aid Highway Act of 1973, Public Law 93-87- August. 13, 1973, 260.

⁹³ Alan Altshuler, "Ripple Effects," (*Architecture Boston*, Volume 15, 2012).

highway through parts of Boston and killing public life that existed there, the government had improved the previously forgotten transit system.⁹⁴



Governor Francis W. Sargent addressed anti-highway activists in front of the State House. Accessed Boston Globe, 1969.

Return of the Link

After laying the groundwork for the anti-highway movement, Boston was ready to continue the trend of investing in public transit. Although Sargent had been the champion of the first highway victory, the high unemployment rate and the massive debt provided an opening for a Democratic challenger. Touted as an honest and passionate politician who simply wanted to attack the problems he believed were ailing Massachusetts, Michael Dukakis was immediately well-received by voters.⁹⁵ During the campaign, he was praised for his modest lifestyle and his frugality, which helped to back up his promise of fiscal responsibility.⁹⁶ He had a great reputation for selflessness and promoting good government, as one Globe reporter noted:

⁹⁴ Ibid.

⁹⁵ Additionally, Dukakis was running with a Lt. Gov whose father was speaker of the house, Thomas P. O'Neil III. Dukakis called this "practical."

⁹⁶ Boston Globe, "Dukakis drives '67 car, lists net worth at \$59,013," August 22, 1974.

“Dukakis is running because he wants to make the state function better, not because he wants the title of governor.”⁹⁷

After he won, Dukakis named Frederick Salvucci as his transportation secretary. They had met while they were fighting the inner belt proposal, and Dukakis knew that Salvucci was a pro-transit engineer with comprehensive projects up his sleeve. The pieces were in place for transit in Boston to make a big comeback. However, the first large scale project Salvucci proposed was an outline of what would later be named the Big Dig. Dukakis was understandably skepticism: he just won the election as a frugal candidate and a promoter of public transit. Salvucci’s proposal was a massive highway project. However, the key feature in the plan that helped to bring Dukakis on board was a double rail connecting North Station and South Station. The North South Rail Link was revived, but only as a piece of the much larger Central Artery Project.

The first step for Dukakis and Salvucci before even announcing the project was to test the waters. Dukakis wanted to be certain no one thought the administration was simply proposing another highway project.⁹⁸ Salvucci aligned the business community, the environmentalists, the North Boston residents (who would have a tunnel dug under their neighborhood), and the entire Massachusetts delegation in D.C. in a matter of months.⁹⁹ His ability to build such a strong coalition took savvy political skills that allowed him to navigate such different interests. But in doing so, the project shifted. To get the business community on board, Salvucci needed to combine the project with another proposal that put a tunnel from Logan Airport to the middle of downtown Boston. Then, he needed to go back to the residents of East Boston and promise them

⁹⁷ “An enigmatic politician--he has a sense of 'mission',” *Boston Globe*, November 3, 1974.

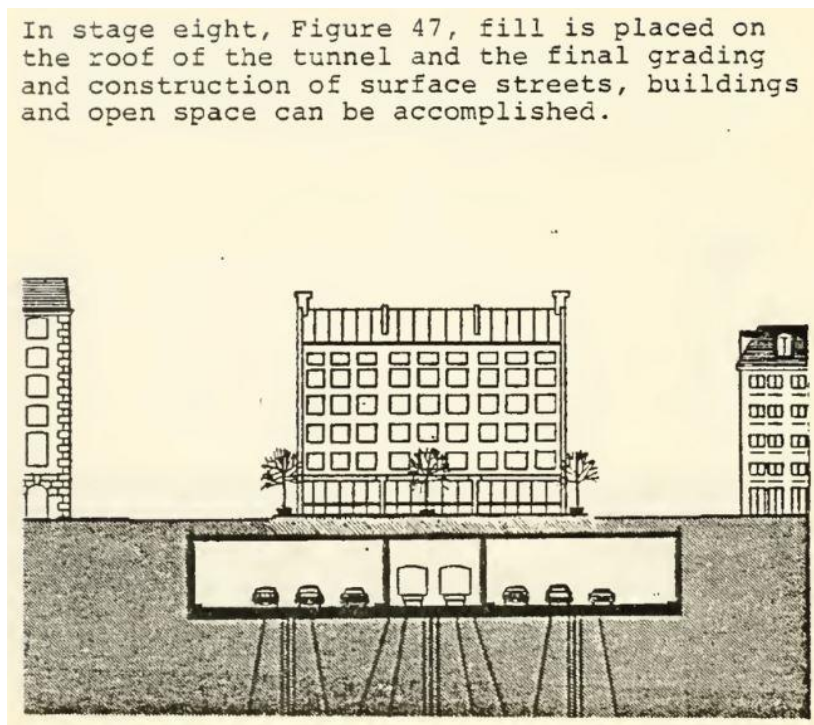
⁹⁸ Personal Interview with Michael Dukakis, November 25, 2017.

⁹⁹ Altshuler and Luberoff, 278.

the tunnel would not surface in their neighborhood and that Logan would not be expanding.¹⁰⁰

The NSRL played a key role in bringing the environmentalists on board. Additionally, there was still a segment of the population that was riding the anti-highway movement, and by putting the rail link in the project, he showed that this was not simply about cars.

When Dukakis officially announced the project, he was clear about the intentions: “We will not bulldoze neighborhoods. We will not take one person’s home. We will not make people so unsure about the future that they are afraid to fix the roof because they don’t know if the state will show up tomorrow and take their home.”¹⁰¹ The administration had aligned the right people and the future of the project looked very promising. Securing the funding, however, was more difficult than they expected.



Massachusetts DPW, Courtesy MIT Library. Accessed from Northsouthraillink.org

¹⁰⁰ After community organizers came to protest large meetings that Salvucci was holding, he switched his method, holding intimate coffee klatches around the affected neighborhoods. This gave him uninterrupted facetime with residents and allowed him to make his case.

¹⁰¹ Laurence Collins, “Dukakis announces \$2.2 billion project,” *Boston Globe*, September 28, 1983.

Securing Federal Funding

Since the early 1930's, the federal government's role in funding transit projects had grown rapidly. While the middle of the century saw massive investments in the highway system, the 1970s served as a turning point. First, there was the Federal Highway Act of 1973, greatly influenced by Massachusetts Secretary of Transportation Alan Altshuler, that allowed for the allocation of highway funding to go towards mass transit projects at up to an 80% match.¹⁰² The following year, the National Mass Transportation Assistance Act of 1974 was passed, which allocated additional funding to help cities with large-scale mass transit projects. This trend continued until the 1980s, when the Reagan Administration began to cut the funding.¹⁰³ This slowed the ability of cities and states, just recently given the power to grow their transit systems through federal funding, to pursue the progressive transportation policies that the 1970s had provided. It also meant the second death of the North South Rail Link.

The fate of this plan - originally pursued by the New Haven Rail monopoly, then by the City of Boston, then by Massachusetts - had landed in the lap of the Reagan Administration. When Dukakis came back to office in 1983 after being pushed out for one term by Democratic challenger Ed King, the Reagan Administration made it clear that they would veto the funding for the Central Artery Project.¹⁰⁴ Reagan had campaigned on cutting government spending, so when he saw Democratic representatives from Massachusetts trying to grab from the pork barrel to fund a transit project in Boston, his administration said it would not fund a 'beautification project.' Salvucci and Dukakis went back to the drawing board: what surfaced was a Central

¹⁰² Senate Bill 502, 93rd Congress, Federal-Aid Highway Act, Jan 23, 1973.

¹⁰³ Oliver Gillham, *The Limitless City: A Primer on the Urban Sprawl Debate* (Washington D.C.: Island Press, 2002), 50.

¹⁰⁴ Dukakis Interview

Artery with more highway lanes underground, pushing out any room for a rail link.¹⁰⁵ While the link had been a critical component to begin with, the funding was still seen as a win-win situation, since Massachusetts was supposed to put next-to no-tax dollars towards the project, and the construction would all be underground. So while the mass transit component was stalled, the business community, the developers in downtown Boston, the construction and highway unions, all stood to make massive gains. The project was now officially a highway project and the Growth Machine was fully on board.

Residents, however, were not so sure. By the middle of the 1980s, after the project had been stalled for nearly a decade, it became clear that community members were having second thoughts. A 1984 *Globe* article presenting the findings from a new poll showed that residents' attitudes had changed dramatically in the span of a few years.¹⁰⁶ "This is an issue of neighborhood rights," said a local resident, who along with others advocated for improving mass transit to fix the problems that the artery was attempting to solve.¹⁰⁷ But there had been too much time and money spent simply getting the plan together to back down now. In response to the activists who concerned about transit, empty promises were made. A coalition led by the Conservation Law Foundation even sued to ensure several improvements, including new stations and cars, a Blue line connection and several other extensions.¹⁰⁸ Many of these never came to fruition and the Silver Line, an additional transit project wrapped in with the Central Artery, was drastically downgraded from a light rail project to a bus route.

By now, all the powerful people in Boston were on board with the project, but it still took incredible effort to secure the funding. Even with Tip O'Neill as Speaker of the House, massive

¹⁰⁵ Ibid.

¹⁰⁶ Chris Chinlund, "Depressed Artery Foes Put Fear Into Poll," *The Boston Globe*, March 4, 1984.

¹⁰⁷ Ibid.

¹⁰⁸ Anthony Flint, "10 years later did the Big Dig deliver?" *Boston Globe Magazine*, Dec 19, 2015.

amounts of lobbying to were necessary to make it a bipartisan bill. Salvucci enlisted businessmen in Boston who were donors to the Republican party to vouch for the project. He got members of the Massachusetts delegation to trade favors with their colleagues.¹⁰⁹ When Reagan's veto was finally overturned in 1987, the project had morphed into a different beast all together. As downtown Boston moved out of the urban renewal period that marked the middle of the 20th century, the Big Dig would define its future.

¹⁰⁹ The story of the final bill getting passed is a fascinating one. Reagan's veto is overridden by one vote, which was only secured after urban Democrats in the House told the Representatives from North Carolina that if they did not get their junior Senator to vote for the bill, they would vote against tobacco subsidies the following year. The Senator was forced to switch his vote and Boston (as well as other cities around the country) secured funding for their transit projects. See Mega-projects (101-103) for more.

Chapter IV: State of the City

Post-Big Dig, Boston has struggled to move forward on transportation projects. In this closing chapter, I will explain the lasting effects of the Big Dig, both on the built city and on the disposition towards large scale projects.

Aftermath of the Big Dig

One of the most interesting facets of the Big Dig is that the original Cost-Benefit analysis was never that impressive. When two of the Federal Highway Administration's most senior planners arrived in Boston in 1985, they were tasked with calculating the difference in Cost-Benefit between the underground Central Artery and the tunnel to Logan Airport. Their findings were surprising. Federal Administrator Ray Barnhart, in a memo to a regional highway planner, suggested that the benefit/cost ratio was between .3 and .5, depending on how much benefit the synergistic effect of the two tunnels combined might have.¹¹⁰ This was far less generous than the ratio the Massachusetts Department of Public Works had come up with for the two projects (1.63 and 1.09 for the Artery and the tunnel, respectively).¹¹¹ However, even after the cost/benefit ratio turned out to be low, the project was deemed eligible for federal funding. This shifted the battle to Congress, where Massachusetts' representatives were ready for the fight.

The allocation of funding for the project was entirely political. The project was not chosen because it was clearly the most beneficial or necessary project in the country, but because the right people made the right moves at the right time. It is indisputable that Massachusetts' powerful delegation is the reason the Big Dig was funded. When the project finished, Salvucci wrote the following in an op-ed about why the tunnel should be named after Tip O'Neill:

¹¹⁰ Altshuler and Luberoff, 101.

¹¹¹ Ibid.

“To memorialize the elected officials without whom the Big Dig could not have happened is to celebrate that there are some actions that can be taken only as civic enterprises, through sensible government action, with the leadership of government officials who have the courage to hang in there, defend the dignity of government service, and even occasionally defend the need for taxes to pay for public services.”¹¹² This type of leadership is only seen at the federal level.

When the project was debated at the local level, it relied on coalition building. It took engagement with the community. When the project moved to the federal level, it was all political. The next time the rail link resurfaced served to emphasize this point. Less than two decades after the idea to connect North and South Station died in Washington, Governor William Weld decided to pick up right where Dukakis had left off. Weld was a Libertarian with generally conservative fiscal policies but had a personal affinity for the rail link dating back to his years as a boarding student at the Middlesex School. His commute from New York involved taking the train to South Station, lugging his bags across the city, before getting on a different train out to the suburbs.¹¹³ The idea to connect the two stations had always appealed to him, so shortly after his election, the Central Artery Rail Link (CARL) task force was convened. Weld laid out the goals of the task force in four points:

- ❖ Close the only gap in intercity rail service along the Atlantic seaboard
- ❖ Develop an integrated regional rail network serving Massachusetts and New England through improved commuter rail service
- ❖ Broaden the public benefits of the Central Artery project through increased regional service, consistent with national transportation and environmental policy

These ideas were simply a continuation of the original vision the Dukakis Administration had put forward: integrating the artery depression and regional mass transit to ensure a successful, multi-

¹¹² Frederick P. Salvucci, “Name the tunnel after Tip? Yes - and here’s why,” *Boston Globe*, July 12, 2003.

¹¹³ Dukakis interview.

modal city. This had been left out of the Big Dig, so it was logical to look for ways to complete the original vision. But there was another key reason that the link resurfaced in 1993. The Senate Majority Leader at the time was George J. Mitchell of Maine, who was eager to bring Amtrak service to his home state. The NSRL would connect Maine to the regional Amtrak network and Mitchell was fully committed to moving the idea forward. Weld put \$1.5 million from the state budget forward to study the project and an additional \$4 million was earmarked¹¹⁴ by Congress.¹¹⁵ But as is the case with discretionary projects on the national level, support only lasts as long as the supporters do. The delays and expense of the Big Dig made it difficult to argue for additional funding for Boston, and Mitchell's time in Congress ended in 1995. By the time the NSRL study was completed in the early 2000s, the Big Dig was billions of dollars over budget, and Congress not too keen about the idea of another project in Boston. The Massachusetts delegation's seniority in Washington significantly decreased in the early 2000's and discussion regarding the NSRL did not appear on the federal level again.

Costs

When a project is debated on the local level, the cost is usually the focus. But even costs can be hard to calculate. After the CARL task force convened, the price tag of the NSRL fluctuated dramatically. The initial estimate by the CARL task force in 1993 was \$1.74B. This rose to \$3.1B after the firm Vanasse Hangen Brustlin was tasked with conducting an extensive environmental evaluation and economic analysis. However, the second figure, produced in 2003, included a 50% contingency provision to accommodate for unexpected design and construction

¹¹⁴ The process of earmarking - setting aside funds for specific projects - was banned in Congress in 2011 because of the way it helped "pork-barrel" projects.

¹¹⁵ Peter J Howe, "Weld commits \$1.5m to study of rail link," *Boston Globe*, 10 July 1993, 15.

conditions.¹¹⁶ Accounting for inflation, this amount was very similar to the original CARL estimate. But soon, the cost estimate suddenly ballooned to \$8.3B when a citizens advisory committee expressed objections and added in additional expenses. This number has been contested, but when Governor Mitt Romney came into office just after these numbers were made available, it was easy for him to pick the highest estimate and cite the expense as over the top. Boston was in the final stages of a project that had risen from a \$2B estimate to over \$20B and Massachusetts taxpayers would be covering much more than originally expected. The thought of another project with anything close to that price tag was out of the question.

This has remained the case for over a decade as long term projects have taken a back seat. Since the Big Dig was finished, there has not been a significant mass transit project completed in Massachusetts. Even after the federal government rolled out an \$840 billion economic stimulus package known as the American Recovery and Re-invest-ment Act, which included at least \$16.6 billion for Massachusetts over two years, the most significant infrastructure project was a 700-foot-long bridge for pedestrians and cyclists. This \$9.5 million bridge, which was originally planned as part of environmental mitigation for the Big Dig anyway (only to be cut as costs rose in 2003), was the grandest of the many bite-sized improvements that the stimulus yielded.¹¹⁷ The best word to describe the current status of infrastructure projects in Boston is inaction.

Growth Machine at its finest

Real estate in Boston today is doing exceedingly well. Property values have risen continuously for years, and while Boston has been a desirable city to live in for a while, the completion of the Big Dig ensured that the downtown area would experience massive growth. In

¹¹⁶ Krystal Beaulieu, An Integrated Regional Rail Network for New England, *National Corridors*, October 2006, 9.

¹¹⁷ Jack Sullivan, "The Stimulus," *Commonwealth Magazine*, Spring 2012.

2017, Boston was the third most expensive rental market in the United States and property development shows no sign of slowing.¹¹⁸ The Growth Machine is doing exceedingly well. Massachusetts has handed out nearly one billion dollars in tax breaks over the past few years, despite the fact that their effects are yet to be fully understood.¹¹⁹ It is unclear how many jobs these tax breaks create or what their addition is to the economy overall, but that has not stopped Boston from using tax breaks to entice companies such as General Electric and Amazon to locate their headquarters in the city.

But Boston is struggling to keep up with its own growth. In the past five years, Boston has reached its largest population since the late 1960s of around 675,000.¹²⁰ The region is growing by 1.3 percent, which is two times the national average and faster than cities such as San Francisco and New York.¹²¹ But the city has failed to provide the appropriate mobility network to accommodate this growth. Gridlock has returned to the levels that were seen before the Big Dig and the transit system remains unable to provide reliable or convenient service. There is chronic underinvestment in these transit facilities. And the problems ailing the MBTA are not just problems ailing Bostonians: the service area covered by the existing Commuter Rail and “T” contains nearly 75% of the state’s population and over 75% of its jobs.¹²² Furthermore, Boston has seen a rise in inequality. In 2016, households in Boston’s 95th income percentile made almost 15 times what those in the city’s 20th percentile did. The Hub is now the seventh-most unequal city in the country and the rapid growth and lack of transit is having noticeable effects on the communities struggling most. As the Urban Land Institute noted in a recent report,

¹¹⁸ U.S. Department of Housing and Urban Development, “Comprehensive Housing Market Analysis,” *Office of Policy Development and Research*, 2017, 3.

¹¹⁹ “How States Are Improving Tax Incentives for Jobs and Growth,” *Pew Foundation*, 3 May, 2017, 67.

¹²⁰ “Boston Population,” *World Population Review*, October 10, 2017.

¹²¹ “Recommendations for Greater Boston, Massachusetts,” *Urban Land Institute*, 6 October, 2017, 12.

¹²² “Regional Report,” *Transit Matters*, 2018.

“Geographic clustering is occurring, further entrenching enclaves of high wealth and of extreme poverty. The communities that have lower incomes are underserved by transit.”¹²³

Recent development has not served to solve any of these problems ailing Boston. The Seaport District is a perfect example: after years of being home to deserted lots, luxury apartments have begun to spring up, taking advantage of the proximity to downtown. But while thousands of apartment complexes have been built, no additional transport facilities have been added. In an interview at Samuels & Associates - a leading development firm in Boston - one of the principals told me that this type of planning is common in Boston. “The city allows people to build what they want as long as it will make the neighborhood look attractive,” he noted, “and then hope that the gaps will be filled in later.”¹²⁴ But gaps in transit infrastructure are not easily filled and the area is already experiencing gridlock with public transit running way over capacity.¹²⁵ The improvement of transit is not simple, but is there any hope for a progressive transit agenda anytime soon? In concluding this thesis, I will explain the forces that need to align and the process it will take for a long term regional rail strategy to take place.

¹²³ “Recommendations for Greater Boston, Massachusetts,” *Urban Land Institute*, October 6, 2017, 12.

¹²⁴ Personal interview, Anonymous, Samuels & Associates, March 22, 2017.

¹²⁵ Nicole Dungca, “GE move puts Seaport gridlock back in spotlight,” *Boston Globe*, January 23, 2016.

Conclusion

The first step towards better mass transit is the acknowledgment of a broken system. In 1891, it was clear the streets of Boston could not continue to withstand the congestion. In the 1970s, there was agreement that highway planning had pushed cities to be overly car-centric and a change was necessary. While the solution to these problems was not immediately obvious or agreed upon, there was a consensus that *something* needed to change. This is beginning to happen in Boston today.

In the last two decades, people have begun to move back to cities and there has been a reversal of the white flight seen after the middle of the century. According to Josh Fairchild, a board member of the citizen advocacy group Transit Matters, this has helped force more media coverage. “The Boston Globe had no sense of transit issues for decades,” Fairchild noted. “Only in the past few years have we seen more coverage.”¹²⁶ This is partly due to the fact that transportation is often not an exciting topic. When the first subway in the country was opening and the system was being electrified, journalists covered every minute of the project because the technology was new, and people wanted constant updates. Today, this is far from the case. A lack of excitement about the issue has also led to a lack of knowledge from elected officials. While transportation affects nearly everyone in the city, it is rare that transportation is someone’s primary voting issue. The main form of advocacy around transportation today is parochial: “‘My bus stop, my fare,’ is how people usually become passionate about transit problems,” as Fairchild said.¹²⁷ Not because they want to fix the systemic issues throughout the city.

This creates a vicious cycle: since people are not voting with transit issues high on their list, elected officials are not transportation experts or advocates. But the agencies such as the

¹²⁶ Personal Interview, Josh Fairchild, March 29, 2017.

¹²⁷ Ibid.

Massachusetts Department of Transportation or the MBTA wait to take their orders from elected officials, not wanting to get ahead of their planning process. This leads to a lack of vision because as politicians come and go (rarely with any solid transportation background), the agencies fail to think years in advance. This leads to a desire to stick with the status quo. There are small projects completed here and there, but there is a lack of political will to think long term. While the “Big Dig hangover” is still looming over these agencies, the lack of a broader vision is equally problematic.

If Boston is going to develop the regional rail system it needs, it is imperative that a prominent elected official articulate that vision and expend political capital, much as Mayor Matthews did in 1891. While people agree on the idea of better transit, no one wants to pay for it -so only a leader who can lay out a compelling case to the public, and other stakeholders, will be able to garner support. That leader will need to convincingly explain how the long-term benefits, and a shift towards a transit-oriented region, would be worth the high upfront cost. While political moments matter - for example, if the Democrats win the majority in Congress next session, the Massachusetts delegation will have several committee chairs - the first step is utilizing less traditional frameworks, other than cost-benefit analysis, to assess the value of public investment. Logan and Molotch, in their explanation of judging an urban project, say it best:

How will the quality of life and access to jobs, housing, and other resources in different communities in the metropolis be affected? What communities will suffer negative impacts, how will they be compensated, and to whom will benefits accrue? Will the sought after corporations, for example, commit to "living wage" programs or another mechanism to promote a high-wage economy? [Next] is sustainability. We must demand of our planners that they look forward decades into the future to assess environmental impacts....There is also the demonstration factor

that goes beyond the local site: Could this project change the way things are done in many other places, yielding net gains to them or to the larger social and natural environment?¹²⁸

For Boston to become a truly livable city, its leaders must take these questions and considerations into account, and indeed, look decades into the future to assess the impacts of their investments.

¹²⁸ Logan and Molotch, xxi.

REFERENCES CITED

- Altshuler, Alan and Luberoff, David. *Mega-Projects: The Changing Politics of Urban Public Investment*. Washington, D.C.: Brookings, 2003.
- Ackerman, Frank. "Critique of Cost-Benefit Analysis, and Alternative Approaches to Decision-Making," *A report to Friends of the Earth*, January 2008.
http://www.ase.tufts.edu/gdae/Pubs/rp/Ack_UK_CBAcritique.pdf
- Altshuler, Alan, "Massachusetts Gov. Sargent: Sarge in Charge." *Journal of State Government*, 1989.
- Alan Altshuler, "Ripple Effects," *Architecture Boston*, Volume 15, 2012.
<https://www.architects.org/architectureboston/articles/ripple-effects>
- Barnico, Thomas, "Brandeis, Choate, and the Boston & Maine Merger Battle, 1903 - 1914," *Massachusetts Legal History*, Vol. 3, 1997.
<http://heinonline.org/HOL/Page?handle=hein.journals>
- Bocarejo, J.P.S., & Oviedo, D.R.H. *Transport Accessibility and Social Inequities*, *Journal of Transport Geography*, Article in Press, 2012.
<https://www.worldtransitresearch.info/research/4280/>
- Boston City Planning Board, *Report: City Document no. 7*, 1914.
- Boston Globe Archives, 1872-1979. Accessed from:
<https://secure.pqarchiver.com/boston/advancedsearch.html>
- "Boston rapid transit," *New York Times*, April 6, 1892, p. 10.
<https://timesmachine.nytimes.com/timesmachine/1892/04/06/issue.html>
- "Boston Population," *World Population Review*, October 10, 2017.
<http://worldpopulationreview.com/us-cities/boston-population/>
- Cashman, Sean. "America Ascendant: From Theodore Roosevelt to FDR in the Century of American Power, 1901-1945." New York University Press, 1998.
- Casey, Robert. "*The Model T: A Centennial History*," Michigan, Johns Hopkins University Press, 2009.
- Clarke, Bradley H. and Cummings, O.R., "Tremont Street Subway: A Century of Public Service," *Boston Street Railway Association*, 1997.
- Congressional Globe*, 1857 - 1863, 35th - 37th Congress.

- Cudahy, Brian. *Change at Park Street Under: The Story of Boston's Subways*. Brattleboro, Vermont: The Stephen Greene Press, 1976.
- Emas, Rachel, "The Concept of Sustainable Development: Definition and Defining Principles," *Brief for GSDR*, 2015.
https://sustainabledevelopment.un.org/content/documents/5839GSDR%202015_SD_concept_definition_rev.pdf
- Federal Highway Administration, "Dwight D. Eisenhower national System of Interstate and Defense Highways," Updated February 1, 2018.
<https://www.fhwa.dot.gov/programadmin/Interstate.cfm>
- Gillham, Oliver. *The Limitless City: A Primer on the Urban Sprawl Debate*. Washington D.C.: Island Press, 2002.
- Grant, H. Roger. "Railroaders and Reformers," *State Historical Society of Iowa*, 1991.
<http://ir.uiowa.edu/cgi/viewcontent.cgi?article=9509&context=annals-of-iowa>
- Hager, Louis P. "History of West End Street Railroad Company," (Self-Published, 1892), 29.
<https://archive.org/stream/historyofwestend00hage#page/28/mode/2up/search/whitney>
- Holland, Kevin J., *Classic American Railroad Terminals*. Boston: MBI Publishing, 2001.
- "How States Are Improving Tax Incentives for Jobs and Growth," *Pew Foundation*, 3 May, 2017.
http://www.pewtrusts.org/~media/assets/2017/05/edti_how_states_are_improving_tax_incentives_for_jobs_and_growth.pdf?la=en
- "Interview with Fred Salvucci," *PBS: Great Projects, The Building of America*, 2002.
http://www.pbs.org/greatprojects/interviews/salvucci_1.html
- Jones, David. *Mass Motorization and Mass Transit*. Bloomington: Indiana University Press, 2008.
- "Letter to the editor: Question of rapid transit," *Boston Herald*, February 13, 1893.
- Logan, John R., and Harvey L. Molotch. *Urban Fortunes: The Political Economy of Place*. Beverly Hills: University of California, 1987.
- Massachusetts Rapid Transit Commission, *Report of the Rapid Transit Commission to the Massachusetts Legislature: April 5, 1892*, 105-106. Link.
- Massachusetts House of Representatives, *Bill No. 382*, 1913.
- Most, Doug. *The Race Underground*. New York: St. Martin's Press, 2014.

- Puleo, Steven. *A City So Grand: The Rise of an American Metropolis, Boston 1850-1900*. Boston: Beacon, 2011.
- Rapid Transit Commission, *Twentieth Annual Report*. June 30, 1914.
- “Recommendations for Greater Boston, Massachusetts,” *Urban Land Institute*, October 6, 2017.
https://americas.uli.org/wp-content/uploads/sites/125/ULI-Documents/Boston2018_Flo.pdf
- “Regional Report,” *Transit Matters*, 2018.
<http://transitmatters.org/regional-rail>
- Seib, Charles. *The Road Ahead*. New York, H.W. Wilson, 1957.
- Shepsle, Kenneth A., and Mark Bonchek. *Analyzing Politics: Rationality, Behavior and Institutions*. New York, NY: Norton, 1997.
- Sullivan, Jack. “The Stimulus,” *Commonwealth Magazine*, Spring 2012.
<https://commonwealthmagazine.org/economy/006-stimulus/>
- Titheridge, Helena et. al, “Transport and Poverty,” *University of College London Press*, 2014.
<https://www.ucl.ac.uk/transport-institute/pdfs/transport-poverty>
- U.S. Department of Housing and Urban Development, “Comprehensive Housing Market Analysis,” *Office of Policy Development and Research*, 2017.
- Vuchic, Vukan. *Transportation for Livable Cities*. Milton: Taylor and Francis, 1997.
- Weingroff, Richard. “Federal-Aid Highway Act of 1956: Creating the Interstate Highway System,” *Public Roads* 60, 1996.
<https://www.fhwa.dot.gov/publications/publicroads/96summer/p96su10.cfm>
- Zipp, Samuel. *Manhattan Projects: The Rise and Fall of Urban Renewal in Cold War New York*. New York, Oxford University Press, 2010.