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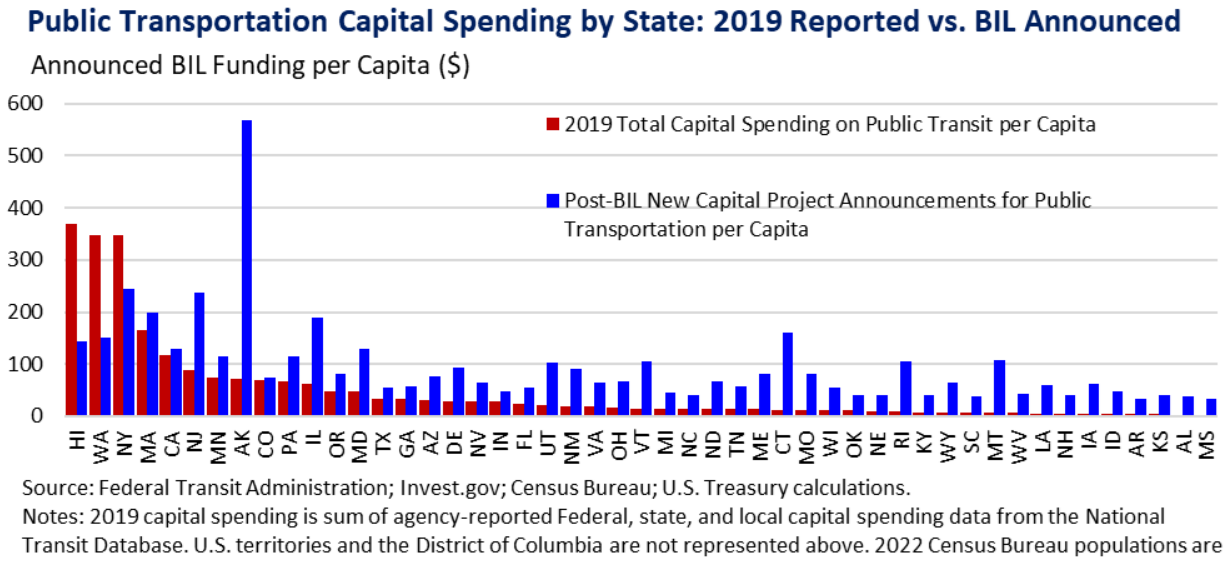
State Capacity and the High Cost of Transit Projects

Introduction

Large-scale infrastructure development is a common strategy used by governments to stimulate economic growth. Here in the United States it was central to urban development at the close of the 19th century, featured prominently in Turkey at the end of the 20th century, and has underpinned China's economic growth in the 21st century (Teaford 1984, Ensari 2022, Lawrence et al. 2019). Transportation infrastructure interacts well with housing development. Even in the 21st century, high-capacity transit enables the seamless collocation of jobs and housing by mitigating the externalities created by automobiles, namely pollution, crashes, and land consumption. This specific point, the triumph of well managed density, is the key to the Abundance Agenda's success. Housing abundance without investments in complementary transportation infrastructure leads to congestion and reduced welfare even with higher economic production (Bunten 2017). This forces the Abundance Agenda to confront the United States' renewed exuberance for funding transit capital projects and its inability to deliver these projects at a reasonable cost.

Federal spending on capital transit projects increased from $1 billion per year in Fiscal Year 2019 to $4.5 billion in Fiscal Year 2024 (Federal Transit Administration 2018; Federal Transit Administration 2023a). Federal support, via the Bipartisan Infrastructure Law, authorizes as much as $108 billion for public transportation through Fiscal Year 2026 (Federal Transit Administration 2023b). If the federal bet on transit investment pays off, the projects we fund now will help

decarbonize the transportation sector, promote greater density, and improve access within and between American cities.



Source: Federal Transit Administration; Invest.gov; Census Bureau; U.S. Treasury calculations.
Notes: 2019 capital spending is sum of agency-reported Federal, state, and local capital spending data from the National Transit Database. U.S. territories and the District of Columbia are not represented above. 2022 Census Bureau populations are

Figure 1: Public Transportation Capital Spending per Capita by State: 2019 vs. Post-BIL Announcements

Even with so much additional money available for capital transit projects, there is mounting evidence that it is too onerous and expensive to build these projects in the United States in the 21st century. In the popular press, Wang (2025), Dunkelman (2025), Klein (2020 and 2022), Gordon (2022), Demsas (2021), and others have questioned America's ability to build large infrastructure projects on time and on budget. Flyvbjerg's (2017) analysis concludes that large infrastructure projects, megaprojects, are consistently over budget, behind schedule, and produce fewer benefits than promised.

If high-capacity transit is a necessary complement to the Abundance Agenda, domestic transit agencies will have to find cheaper ways to deliver capital projects. Goldwyn et al.'s Transit Cost Project (2024) found that in a sample of 1,007 rapid rail projects across 60 countries and 200 cities, the United States had the eighth highest costs per kilometer in Purchasing Power Parity adjusted 2023 dollars. The seven countries with higher average costs build 65% or more of their

track-kilometers in tunnels, the most expensive construction method. In the United States, only 34% of domestic track-kilometers are tunneled. The US transit cost problem is real and it is only getting worse. The latest cost estimates for projects under development in the United States, such as Phase 2 of the Second Avenue Subway (Phase 2), Gateway Tunnel Project, Transbay Downtown Rail Extension, West Seattle and Ballard Link Extensions, and the BART extension to San Jose have seen their absolute and per kilometer costs rise, outpacing, in some case, their very expensive predecessors (United States Department of Transportation 2024). Higher costs mean less high-capacity transit per dollar spent and less dense housing supported by expansive transit networks.

The cost drivers of transit projects are manifold. In this paper, I focus on how the lack of state capacity at the federal level and at transit agencies help explain these persistently high costs and delays. Without capable agencies that can meaningfully participate and guide the planning, design, engineering, and construction management of these projects, costs will only grow as consultants and expensive decisions go unchecked by the public sector. I show this by documenting the federal government's diminished capacity and how two recent projects, the Green Line Extension in Massachusetts and Phase 1 of the Second Avenue Subway in New York sprawled into bigger, more expensive projects because the delivery agencies were unable to rein them in on their own.

I rely on quantitative and qualitative methods to describe and explain why American rapid rail transit costs are higher than global averages. First, I draw on quantitative evidence to develop key descriptive statistics, namely a global weighted average of rapid rail projects per kilometer, and contextualize global rail transit project costs to demonstrate empirically that American projects exceed international averages. Next, I take an in-depth look at two domestic transit

projects that entered into revenue service in the last 10 years, Phase 1 of the Second Avenue Subway (Phase 1) in New York and the Green Line Extension (GLX) in Massachusetts. I examine planning documents, official reports, historical accounts, media coverage, and the megaproject and project management literatures to understand the development and shortcomings of specific projects. I also conducted 125 semi-structured interviews with elected officials, agency staff, consultants, contractors, laborers, and others familiar with GLX and Phase 1. I show how even these agencies blessed with extensive legacy systems struggle to make decisions and manage consultants. Specifically, how decisions made early on in the planning and design process led to construction challenges and high costs. I conclude by sharing some good news: it is possible to build these projects faster and cheaper, but it requires resources for agencies to nurture expertise so they can plan, design, and manage rapid rail transit projects.

Data

The project level cost data used in this paper comes from the Transit Costs Project (2024) database. In sum, the dataset consists of 1,007 rail transit projects stretching 20,765.79 kilometers across 60 countries and 200 cities. The cost data is normalized using Purchasing Power Parity conversion to adjust for cost-of-living differences and all costs are inflated from the midpoint of project construction to 2023 US Dollars. In collecting this data, the Transit Costs Project team focused on headline project costs rather than more granular measures because they wanted a cross-sectional dataset with as many countries represented as possible to better understand the universe of transit projects. The data does include additional detail, such as route kilometers, number of stations, and the proportion of tunneled route kilometers. Additional

items, such as rolling stock, maintenance facilities, financing, and taxes are netted out where possible so as to keep the data consistent.

While lump sum project costs are imperfect when comparing individual project elements against one another, they describe the global rail rapid transit project landscape. Total costs allow us to develop descriptive statistics and draw conclusions about how much projects *should* cost based on averages. Flyvbjerg et al. (2003) also compiled a dataset of 258 transportation infrastructure project, with a subset including 58 rail projects. Their analysis focuses on cost escalation and reduced benefits. While cost overruns happen, they happened in New York and Boston, and there are important lessons to learn from them, I examine the aggregated data to understand global averages to inform further research that asks *why* costs vary?

This two-step process allows us to first understand the universe of projects, and then make informed decisions about which projects we should study in greater detail. If we understand why costs vary, then we can translate practices from low-cost countries, such as Spain, Turkey, South Korea, and Italy, to the American context. Based on the Transit Cost Project data, the global weighted average cost per kilometer is $239.07 million in 2023 dollars. Domestic projects have a weighted average cost per kilometer of $626 million in 2023 dollars, the eighth most expensive in the world (fig. 2). American projects, however, have a lower proportion of tunneled track-kilometers than projects in more expensive countries. Only 34% of the United States' 180.8 track-kilometers in the database are tunneled, while 65% or more of the track-kilometers in more expensive countries are tunneled. I underscore tunneled track-kilometers because tunneling is the most expensive rail construction method and it is positively correlated with costs (Flyvbjerg et al. 2013). Based on this data, American transit projects are more expensive to construct than

projects abroad, and, as noted above, projects under development are expected to be even more expensive on a per kilometer basis. This finding is alarming because it means that each dollar spent in the future will yield fewer kilometers of transit.

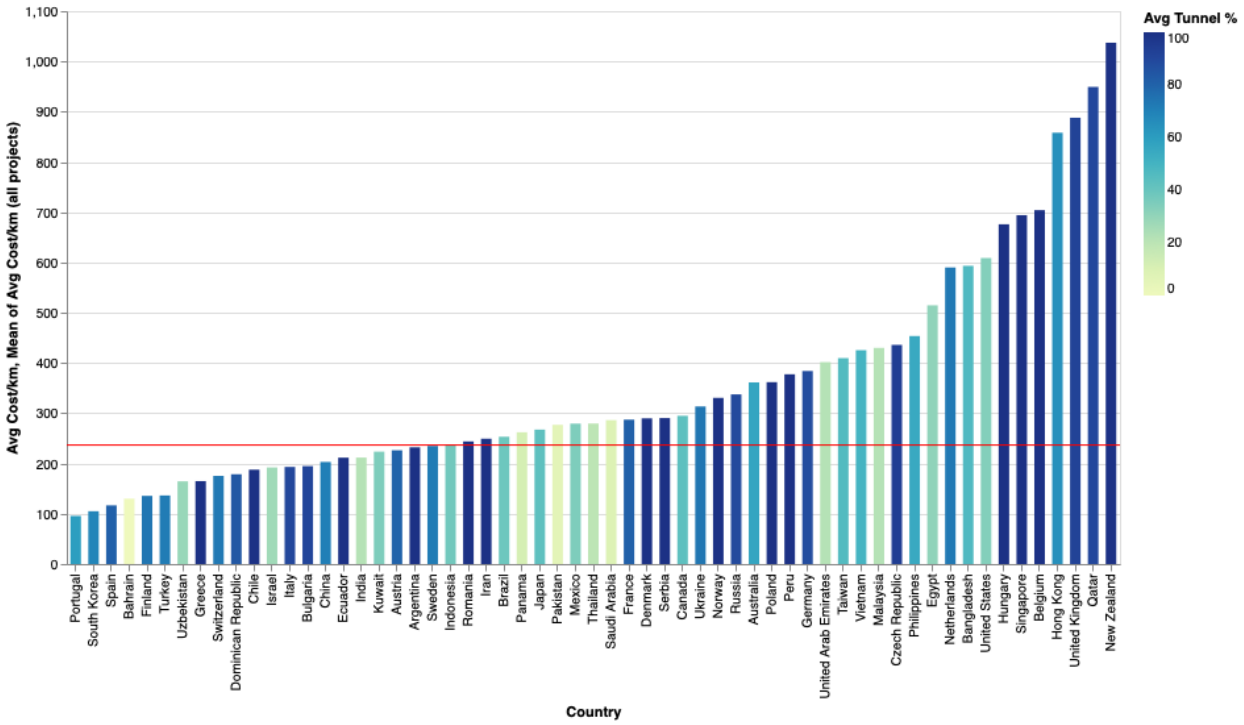


Figure 2: Average Costs per Kilometer and Global Weighted Average in Red

Public Sector Transit Capacity

The close of the nineteenth and the first half of the twentieth century were a golden age for domestic transit infrastructure construction in built-up cities like New York, Boston, Chicago, and Philadelphia (Wallace 2017, Most 2015, Reardon 2020). The second half of the twentieth century gave rise to the automobile and jet age (McShane 1995, Jones 2008, Norton 2011). In addition to large-scale changes to the built environment and the shift in transit service provision, from private sector operations to municipal ownership and operations to the creation of state authorities, American transit capacity and know-how diminished as attention and resources were diverted to other priorities.

As American cities began to regain interest in building new transit systems in the 1970s, new agencies were born. This new generation of American transit agencies were not directly controlled by an engaged mayor or staffed by subject matter experts with decades of experience building complementary public works such as sewerage, elevated train lines, or railroads a generation earlier. Instead, these agencies turned to outside consultants to bolster their thin expertise (New York Times 1914; Plotch 2025). These new agencies also differed from their predecessors in how they were funded and governed. Without existing fare box revenue to draw on or bond out, these new agencies sought sales tax measures and federal dollars to build their new networks (Elkind 2014, Schrag 2006, Kershner 2019).

It was also during this period, that the federal government's embrace of consultants and contractors at the expense of full-time employees took shape. DiLulio (2014) dates this transformation to at least the 1960s and describes it as a Leviathan by Proxy model, where the federal government's full-time employees, the ones responsible for doing the work of government, were replaced by overlapping "proxies" who were supposed to the do the work of government more efficiently and better, namely consultants, non-profits, and state and local governments. To DiLulio, the transition has been detrimental and not achieved its stated goals: While federal headcounts remained relatively flat to down as compared to population growth between 1960 and 2012, the federal government expanded the number of agencies, took on debt to pay for additional services, increased overall spending by five times, ceded policy implementation and development to contractors and consultants, and government became fragmented in ways that make it difficult to trace a straight line from policy idea to implementation. Pahlka (2023) writes about this dissonance between theory and practice when

she describes how government has struggled to adapt to the digital age. Instead of the promise of delivering more service better via a smaller, more nimble government that is able to outsource software development and website construction, the federal government has paid untold billions for buggy software and user-unfriendly websites. Without experts in government to define and manage these projects, they are doomed to fail. She writes, “But starving government of know-how, digital or otherwise hasn’t made it shrink. It has ballooned it. Sure there are fewer public servants, but we spend billions of dollars on satellite software that never goes to space, we pay vendors hundreds of thousands of dollars for basic web forms that don’t work, and we make applying for government services feel like the Inquisition” (p.135).

At the federal level, both the Federal Railroad Administration (FRA) and the Urban Mass Transportation Administration (UMTA), renamed the Federal Transit Administration (FTA) in 1991, experienced the challenges created by this fragmentation as funding cuts and headcount reductions sidelined both administrations’ research arms. Knapp (1988, p.40) reports the depth of UMTA cuts when she writes, “[d]uring the 1980s, federal funding for research and development has dropped dramatically (UMTA research spending dropped from $60 million annually in the 1970s to approximately $22 million in 1987).” As a result of these cuts, federal support for transit research shifted from the practical day-to-day concerns and needs of local transit agencies, how to build stations affordably, to more ideologically driven research on privatization and broader market trends (O’Neil et al. 1977).

At FRA, these cuts help explain why FRA safety regulations required Amtrak procure an Acela fleet destined for breakdowns and opprobrium. As Hicks (2025, pp.94-95) explains, in the span of 15 years, lessons learned from rolling stock research that had been carried out by the FRA

in 1981 had been forgotten. When Congress held an oversight hearing examining the poor performance of Amtrak's new $611 million Acela fleet, no one at the FRA remembered what the railroad regulator once knew: the interaction of heavy rolling stock, high speeds, and tight curves wears down the trains' wheels and brakes and causes more frequent breakdowns. Dao et al. (2005) sum up this moment by highlighting how outdated crash safety standards impacted other train design facets that led to this embarrassing moment: "Before the first train was built, the Federal Railroad Administration required it to meet crash safety standards that senior Amtrak officials considered too strict. That forced the manufacturers, Bombardier Inc. of Canada and GEC Alstom of France, to make the trains twice as heavy as European models. Workers dubbed the trains "le cochon" -- the pig." Had FRA maintained its research group, American taxpayers would have received better value for its $611 million.

Learning the State Capacity Lesson the Hard Way

The Green Line Extension (GLX) highlights the importance of state capacity at transit agencies because the project was delivered in two dramatic acts that highlight different approaches to public sector capacity. In the first act, a lean agency with limited in-house capacity relies on an army of consultants and contractors to complete the project. At the close of Act 1, the project's estimated budget grows from $1 billion to $3 billion and an unhappy governor cancels the project (Massachusetts Department of Transportation 2015). In the second act, the unhappy governor gives the agency an opportunity to salvage the project. A new team is assembled within the agency, this time led by someone who has delivered rail projects before, and they build the 7.6 kilometer extension and seven new stations within the governor's approved $2.3 billion budget (fig. 3)(Massachusetts Bay Transportation Authority N.D.). GLX

provides a caution about lean agencies managing too many consultants, but also points a way forward: A well-resourced public agency with experienced staff can deliver a challenging megaproject if it has the capacity to manage the different project domains effectively.

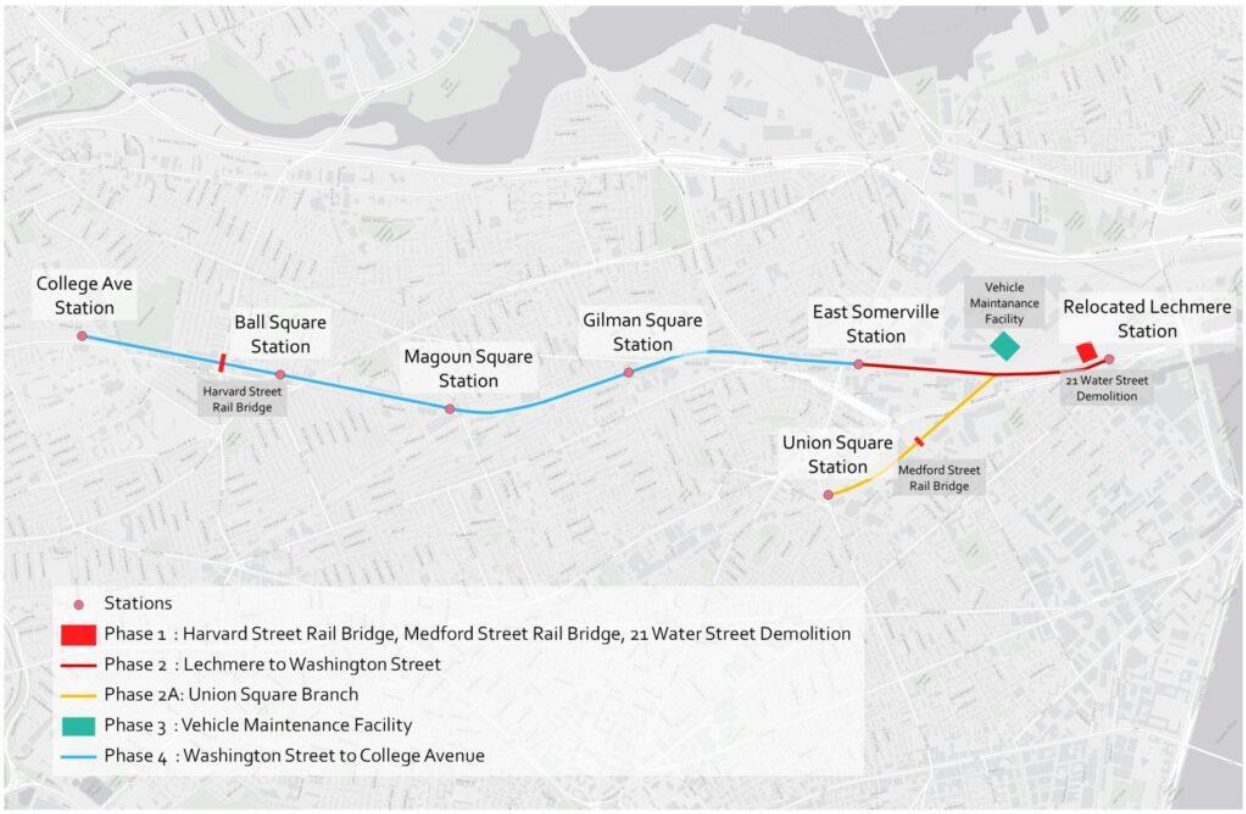


Figure 3: Green Line Extension Alignment and Stations

Even though Boston's rail system is the oldest in the country and the MBTA did deliver capital projects from the 1960s to the 1980s, the agency did not have the capacity to plan or manage GLX by itself at the outset. The combination of the very expensive Big Dig and the election of William Weld, who rose to power with the explicit goal of shrinking the government workforce and closing a growing budget deficit, in 1990 meant fewer discretionary dollars for transit projects like GLX (Tabor 1991; Rappaport Institute 2003). By 2005, on a day-to-day level, the MBTA no longer knew how to manage megaprojects like GLX because the most experienced construction

managers had left the agency or retired a decade or two earlier (Mohl 2018). At the start of GLX, the confidence in the MBTA was so low that project ownership bounced between the transit agency and the Commonwealth's department of transportation.

Without the MBTA's earlier generation of subject matter experts on staff, the Commonwealth turned to consultants. First, it hired Vanesse Hangen Brustlin (VHB) to complete an Alternatives Analysis in 2005. Then, in 2011, as the project became more of a priority to Governor Deval Patrick and the MBTA was firmly in charge of it, the MBTA hired a joint venture between HDR and Gilbane (HDR/Gilbane) to manage the project, advance the design to 10% design, and prepare contract documents for construction. A year later it hired another joint venture, this time between AECOM and HNTB (AECOM/HNTB) as a design consultant to advance the HDR/Gilbane work to 30% design. It was also in 2012, that the MBTA's coterie of consultants advised the agency to pursue a Construction Manager/General Contractor (CM/GC) procurement strategy that would allow the agency to hire a prime contractor to provide preconstruction advice and pricing estimates before finalizing design. Before the project was cancelled in 2015, the MBTA would also hire an Independent Cost Estimator and an Owner's Representative. More consultants to manage.

Throughout this first phase of GLX, marked by hiring more and more consultants and not developing internal capacity, projected costs increased from $1 billion to $3 billion and the MBTA demonstrated that it was neither nimble nor able to extract value from its consultants. Without agency staff to manage the project, it was impossible to provide meaningful oversight and direct the consultant teams to focus on the most pressing work. Based on interviews with senior officials who worked on GLX, I was told that there were only five to six staff engineers available to review

designs and field inquiries from the consultants about technical issues that required agency sign off, such as communications specifications or the planned CCTV build out (Personal Interview A 2020; Personal Interview B 2020). With limited staff, decisions rolled out slowly creating bottlenecks that added delay and buried the MBTA's engineers in endless reviews.

In GLX's second act, from 2017 to 2022, greater attention was paid to developing a public agency that could manage the project's different interfaces. In Act 1, the MBTA had five to six engineers on hand to manage the largest project in the agency's history. In Act 2, that number grew to over 100. One senior project leader from this period told me that "I would rather be overstaffed than understaffed" (Personal Interview C 2020). Unfortunately, for the MBTA and Boston, GLX's project delivery team was dismantled after project close out. One only assumes that the MBTA will be forced to relearn the state capacity lessons from Act 1 as it considers new large-scale capital projects.

High Costs Don't Scale

Phase 1 of the Second Avenue Subway, like GLX, underscores the importance of robust in-house capacity. The key difference between the two projects is that Phase 1 was not cancelled and forced to reckon with its high costs, even though they were more than $1.7 billion per kilometer in 2023 dollars, and by extension, its capacity deficits and other challenges. GLX, as we will see below (figs. 6 and 7), is a no-frills monument to learning the state capacity lesson the hard way. Rather than opulent headhouses at each station, GLX was stripped down to the basics, unenclosed platforms with a canopy. Phase 1, on the other hand, the most expensive in-service subway project in the Transit Costs Project's database on a per kilometer basis shows just how expensive it is to neglect capacity building and how that has stymied the agency's ability to deliver

more than 2.7 kilometers, three new stations, and one refurbished station of the full-length project (fig. 4). High costs forced the MTA to break the project up into four phases rather than pay for it all at once; thus, extending the overall project's timeline by decades and depriving New Yorkers of valuable transportation benefits and opportunities for new development and housing abundance.

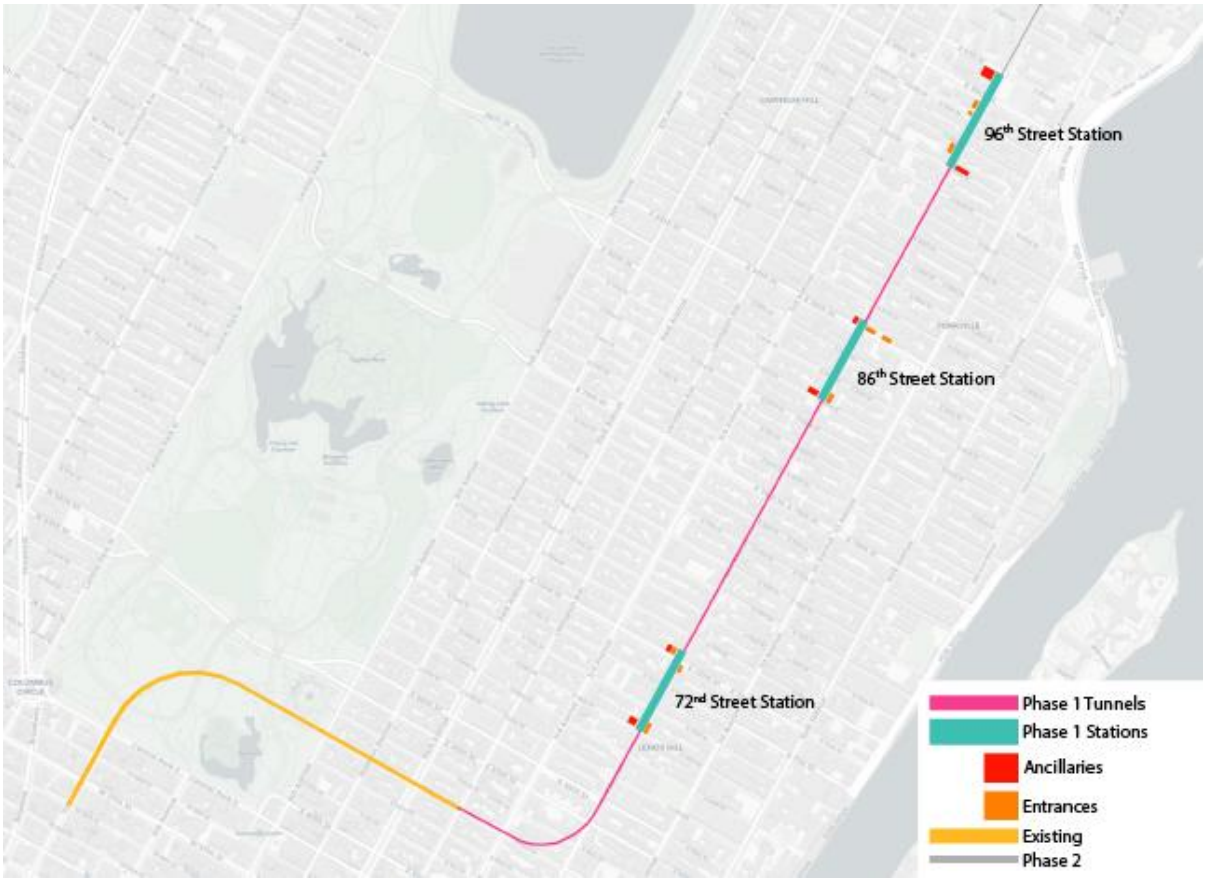


Figure 4: Phase 1 of the Second Avenue Subway

While Phase 1 highlights the high costs of diminished capacity, the MTA maintained its ability to execute through the 1990s and into the early 2000s via New York City Transit's (NYCT) Department of Capital Program Management (CPM). CPM was created to build back the NYCT's decrepit subway infrastructure in the early 1980s. CPM had roughly 1,600 full-time employees during the 1980s and 1990s. Based on interviews with former CPM staff, I was told that this team

completed 60% of the capital design work and managed 95% of capital construction (Personal Interview A 2022). Clearly this team had the subject matter expertise required to answer questions about relevant technical details.

By 2003, however, as Phase 1 of the Second Avenue Subway was wrapping up its environmental permitting, the MTA began to phase out CPM through attrition. Instead hiring new engineers as staff retired, it allowed those positions to go unfilled. Instead, the MTA created a new capital delivery agency, MTA Capital Construction (MTA CC) that would manage most capital projects across the MTA's primary operating agencies, this includes the two commuter railroads, Metro-North and the Long Island Rail Road. By 2011, as the MTA was in the midst of delivering three additional capital projects besides Phase 1 with a combined $20 billion price tag, roughly ten times more than the final cost of GLX, MTA CC only had 124 full-time employees (Metropolitan Transportation Authority 2012; Metropolitan Transportation Authority 2019).

With so many projects under construction and so little staff on hand, the MTA did what the MBTA did: it hired consultant teams to handle the design, draft procurement documents, assess bids, run public engagement, and manage construction. As we saw with GLX, just because an agency hires international consultants doesn't mean it will get world class results. In my interviews with consultants who worked on the project and relevant MTA staff, consultants were not always well utilized and the agency often did not know what it wanted and relied on the consultants to complete core tasks such as developing station design standards even though the NYCT had its own standards.

With so many consultants working on the project, MTA staff leaned on them to answer questions it should have answered itself; thus, missing an opportunity to develop know-how.

Using the consultants as a crutch or a proto-AI chat bot, the MTA further diminished its ability to be a well-informed manager, a valuable attribute for an agency with $20 billion worth of projects under construction and at least three more phases of the Second Avenue Subway to build. One former MTA CC manager described MTA staff's relationship to the consultants as "an endless resource to study everything" (Personal Interview A 2021). There are benefits to an endless resource to study everything, but MTA CC also studied things that provided marginal value and slowed down the project, though financially rewarding for the consultants. As the MTA began to devise its procurement strategy, for instance, it asked its consultants to study different ways to package construction contracts. The consultant team assessed every option between 6 and 29 contracts to deliver Phase 1 (Personal Interview A 2021 and Personal Interview B 2021). Was this strictly necessary when the final construction packages followed a logical breakdown of contracts by station and task, heavy civil work versus finishes?

Even the consultants found this surprising. When it came time to design the three new stations for Phase 1, the MTA asked its design consultants to develop new standards rather than follow existing ones (Personal Interview C 2021). This meant the consultant team had to undergo a review of contemporary station designs, including travel to Asia, interview the different user groups at New York City Transit to better understand their needs, and so on (Personal Interview B 2022 and Personal Interview C 2022). Considering the MTA had opened three new stations in 1989, the consultants assumed the MTA had relatively recent design standards to work from (Lorch 1989). The design team developed new design standards for Phase 1, but, invariably, these designs occasionally clashed with existing standards such as tile dimensions, fire alarm

specifications, or the need for toilet partitions, all which required re-work, delay, and change orders.

While GLX fits into a cleaner two-act structure than Phase 1, Phase 1 underscores the importance of bringing down absolute costs rather than focusing strictly on overruns. With such high per kilometer costs, it is difficult to imagine New York building more than a few kilometers of subway every decade. With greater upfront investment in agency capacity, perhaps some of the $656 million spent on design and construction management consultants could be used to invest in a stronger capital construction arm that manages projects better, responds to inquiries faster, and has more confidence in its ability to deliver without a team of support consultants.[1]

Expensive Design Decisions

One of the clear lessons from both projects was that internal capacity is not just about effectively managing consultants. These big, sprawling capital projects also require internal discipline, another byproduct of the Leviathan by Proxy model where the consultants rather than the internal actors are the go-betweens to resolve conflicts within an agency. In both cases, the agencies routinely committed self-inflicted wounds by opting for more expensive design solutions than were strictly necessary because the capital delivery side was unable to say no to more expensive design decisions made by NYCT. Without national transit station design standards, each agency follows its own standards, or turns to consultants to develop standards and designs based on peer agencies and internal input. Without guidelines and standards to structure the design process, something that exists in a low-cost country like Italy, allowed both the MBTA and MTA

[1] It is worth noting the MTA has learned some of these lessons, and has been actively staffing up its new capital construction agency, MTA Construction and Development (DiNapoli 2025).

station designs to grow by adding considerably more "back-of-house" space, the non-passenger areas reserved for agency staff, than lower cost international peer agencies, like France, Denmark, Sweden, Italy, and Spain (Chitti et al. 2022, p.61-64). In the case of GLX, which was redesigned during its second act, much of the savings that allowed the project to proceed came from replacing architecturally striking headhouses with much cheaper open-air platforms and reducing the vehicle maintenance facility's footprint.

Underground construction is expensive. This means that subway stations are usually more expensive than at-grade or elevated stations. Before UMTA saw its funding cut in the 1980s, it hired O'Neil et al. (1977) to study global subway station design and construction. The research team visited stations in 12 cities across the United States, Mexico, Canada, and Europe, and found that underground stations were, on average, 2.5 to 3 times more expensive than elevated stations and four to five times more expensive than at-grade stations. Phase 1's station construction costs totaled $2.44 billion, or 77% of $3.16 billion in total construction costs.[2] A closer examination of the stations reveals that the station boxes, the total excavation required to build them, for 72nd Street, 86th Street, and 96th Street differ significantly from one another despite having the same 187-meter long platforms. The three new station boxes measure 485, 398, and 295 meters long, or 60% to 160% longer than the platform (figure 5). When I compared these proportions to other stations from around the world, I found that in low cost and medium cost countries, station boxes were often 2% to 20% longer than station platforms. Ensari et al. (2022) found that the newest designs for Phase 3 of Istanbul's M3 line connected platforms to smaller cut-and-cover station

[2] In Turin, M1's 27 stations follow simple, repeatable designs that are constructible and maintainable. M1's stations accounted for only 31% of the total construction costs (Chitti et al. 2022, p.61).

boxes shorter than the overall platform length in order to minimize property taking into Istanbul's densely built-up urban environment.

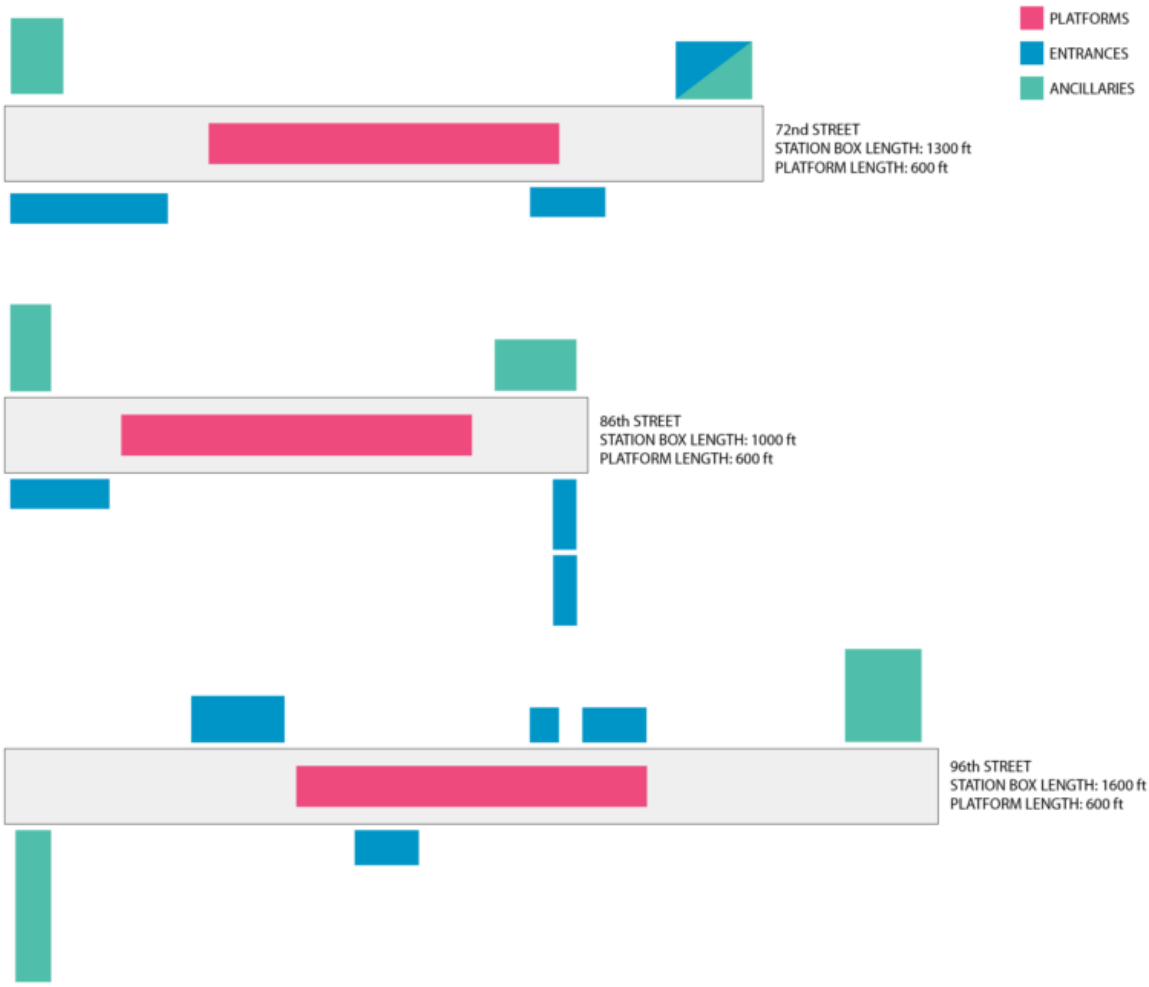


Figure 5: Phase 1 of the Second Avenue Subway Station Diagram

The MTA ended up with vastly larger stations than anywhere else in the world because the operating agency, NYCT, demanded underground "back-of-house" space for track maintainers, electricians, train operators, and other user groups that operate and maintain the subway. These spaces include offices, changing rooms, dining rooms, storage, and work spaces. A former NYCT president told me, "Back-of-house space is important. You can never have enough of it…. If you don't get it during construction, you're never going to get it" (Personal Interview D

2022). While one understands the NYCT president's sentiment, just like one understands the appeal of consultants who are an endless resource to study everything, there is a difference between what is the minimum amount of back-of-house space required to maintain and operate the subway, I would argue the 2% to 20% longer that the station platform mentioned earlier, and what is the most space NYCT can get. For Phase 1, NYCT succeeded in securing separate, unshared spaces for each NYCT user group. By contrast, when one looks at the station design concept proposed in the Final Environmental Impact Statement from 2004, the design consultants proposed consolidated, shared rooms, a common practice used in other countries and being embraced for Phase 2 (Metropolitan Transportation Authority 2004, p.2-7; Metropolitan Transportation Authority 2022, Figure 2-6).

While Phase 1 grew its costs by adding space, GLX found savings by cutting back the elements that were nice to haves, but not central to the project's success. GLX's second Act forced the MBTA to be more disciplined and focused on delivering the project within a constrained budget. This meant that the project designed in the first Act had to be scaled back. An Interim Project Management Team was hired to value engineer the project and deliver it for no more than $2.3 billion. The Team focused its efforts on paring back the number of bridges the project would rebuild or refurbish from 11 to six, simplifying the seven new stations, and reducing the size of the vehicle maintenance facility. For the sake of brevity, I will focus solely on the Team's work value engineering the stations because this example clarifies how the project spiraled and grew beyond the initial project described in the 2005 Alternatives Analysis.

After the Interim Project Management Team finished its GLX assessment, it estimated that the 7 new stations would cost $409.5 million, or $58.5 million per station. In its revised proposal,

it eliminated the fully enclosed iconic station structures (fig. 6) that included personnel rooms, bathrooms, multiple floors, and elevators, and adopted a more restrained design: single-level, open-air platform with a canopy that followed the designs conceived back in 2005. This change led to a new estimate of $121.2 million, or $17.3 million per station, a 70% savings from the initial estimate. Not only did the new plan eliminate amenities, but it also cut back on the quantities needed to build each station, such as the amount of concrete, steel, and electrical wiring (fig. 7). Overall, the new plan shrunk the overall station square footage by a staggering 9,959 square meters, a 91% savings.

Figure 6: Proposed Union Square Station 11/6/2014

Figure 7: Union Square Station

Conclusion

It is possible to build big things in the United States. What is needed, however, is a recognition that large capital projects need to be managed by well-resourced public agencies that know what they want and have experienced leaders who have delivered projects on time and at a reasonable cost. As domestic transit projects' capital costs soar, this is a moment for introspection. Why is it so expensive to build transit projects in the United States? The MBTA was forced to confront this question in 2015 when Governor Charlie Baker threatened to cancel the project. It responded by building a new organization within the MBTA that proved capable of delivering the project. The agency hired a Program Manager with a record of building big projects,

paid him a market rate, let him assemble a newer and bigger team, and granted him the latitude to run the project outside the agency's typical reporting structure (Mohl 2016 and Dalton 2022). The MTA had an opportunity to consider this question when it realized that its high costs made it impossible to finance a full-length Second Avenue Subway. It didn't begin to acknowledge its cost issues and takes steps to correct them until it began designing Phase 2. It started by scaling back station designs (Hicks 2023).

While American transit projects are among the most expensive in the world, the aggregated data does not explain why American projects are more expensive than those in low-cost countries. Based on a review of the literature and two in-depth case studies of projects in New York and Massachusetts, I focused on how a lack of state capacity inhibits agencies from effectively delivering projects. First, the diminution of transit knowledge at all levels of government, from the United States Department of Transportation to local agencies, has left public sector transit oversight unable to manage or address its shortcomings. Why couldn't the FTA intervene and tell the MBTA or MTA that their station designs were too grandiose? Second, without a clarifying jolt or a crisis, like Governor Baker's threat to cancel GLX, there's little incentive to develop or assert the capacity to deliver transit projects better. Third, in contrast to GLX, Phase 1's leadership was content to deliver less rather than confront the internal agency dynamics that enabled the expensive station design bloat that drained its budget. Instead, leadership scaled back portions of the project and split it into more affordable phases rather than build the capacity needed to deliver a full-length Second Avenue Subway.

It is easy to be discouraged by the high costs of domestic transit projects. There are, however, reasons to be optimistic. Agencies have begun to recognize the problem. The MBTA

didn't maintain the GLX team, but it did recognize that it had to build a new organization and pay leadership market rates to confront its rising costs. The MTA hasn't solved its cost issues either, but it has taken the step of scaling back stations for Phase 2 and staffing up MTA Construction and Development, the MTA's capital delivery agency. Sound Transit is in the midst of a thorough self-examination to understand why its costs keep increasing. It has followed some of the lessons from GLX, it hired a new head of capital construction and paid her more than the CEO (Lindbloom 2024).

None of this guarantees success, but it does affirm that transit agencies are paying attention. In this paper, I have argued that agency capacity is central to America's high transit capital costs. The agencies that invest in proven leaders, retain and nurture subject matter experts who can effectively manage consultant teams, develop simple and repeatable standards, and actively reclaim core planning, engineering, and construction management tasks from their consultants will bend the cost curve down. Consultants will always be important, there's little need for an agency to employ scores of station and tunnel engineers, but agencies should have leadership who understand the main disciplines of transit construction, such as tunnels; stations; fire, life, safety; rolling stock; and systems. If we succeed in lowering transit capital costs, we unlock the potential to deliver an Abundance Agenda that seeks more affordable and higher density housing spread across vibrant American cities.

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