

# **Exploring the Perennial Struggle for Sustainable Finance of the New York Metropolitan Transit Authority**

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**Abstract:** The New York City transit system is one of the largest in the world. Featuring a 24-hour subway, buses, commuter rail and other modes, New York serves about one-third of the overall share of transit travel in the United States. Yet even for the size and ridership the Metropolitan Transportation Authority has been financially troubled for decades. This case reviews the historical and current ways the system was developed and financed and discusses the implications for sustainable finance. Current and future efforts to secure new funding sources beyond the farebox are also discussed, and there are important lessons to be learned for metropolitan areas in both developed and developing countries about the dynamics of the financial and economic challenges that alternative approaches to sustainable urban transport finance will encounter.

# Exploring the Perennial Struggle for Sustainable Finance of the New York Metropolitan Transit Authority

*David A. King*

## Introduction

Financing transit in the New York metropolitan area has always been a challenging endeavour, from early constraints of the nickel fares to modern day budget shortfalls of hundreds of millions of dollars. This case study highlights many of the pivotal eras of paying for the expansion and operations of the subway, bus and commuter rail lines for which the current Metropolitan Transportation Authority (MTA) is responsible. Transit in New York has required a mix of farebox revenues, local, state and federal subsidies, toll payments from autos, debt financing and other means of paying for capital and operating costs. Not all of these mechanisms have been equally successful in creating a sustainable financial model, and many of the problems that New York has faced are not unique. This case can provide insight for other cities across the United States and other developed countries for sustainable transit finance.

The creation of the MTA was part of a broad effort to improve the financial outlook and efficiency of transit in the region. In 1968 New York State consolidated the administration and financing of all of its transport infrastructure and rolling stock in the New York City metropolitan area into a single mega regional transport agency, the Metropolitan Transportation Authority (MTA). The intention of this act was, in large part, to consolidate the finances for all forms of transport including commuter heavy rail, private automobile, metro and fixed route buses for an area extending over 50,000 square miles containing a population of about 20 million people in 2010.

The New York MTA is responsible for the New York City subway system, New York City Transit, Long Island Railroad, Metro-North Railroad, Long Island Bus and Bridges and Tunnels in the New York metropolitan region.<sup>1</sup> The MTA operations are largely contained within New York State, with the Metro-North Railroad extending northeast into Connecticut. The first decade of the MTA was one of financial catastrophe for the city and state. The transit systems went further into decline in terms of reliability and safety, ridership fell and the MTA struggled to pay for operations and put off maintenance and investment. It was only with large loans from New York State, new dedicated sources of revenue and strong new leadership the MTA was able to turn the agency's fortunes around.

In the 1980s and early 1990s new investments in the region's transit systems were undertaken and improved performance, maintenance and safety of the system. During this period ridership and reliability began to increase. In 1982 a typical subway vehicle went 7,145 miles between repairs, and by 2009 the average miles travelled was 153,201 between repairs (Metropolitan Transportation Authority, not dated). In the 1990s the introduction of Metrocard fare media spurred a large growth in ridership by revolutionizing the economics of taking transit for individuals. Free transfers and 'one-swipe' boardings helped restore system ridership to levels last achieved in the 1950s, though still well below peak ridership in 1947. Investment in the transit system including commuter rail has paid off in the real estate markets as well, as nearly all of the population growth that has occurred since the late 1990s has been absorbed by the transit systems, leaving total auto usage in the region stable.

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1. For full information about the operations and maps of the service areas, please see the MTA website: <http://www.mta.info/about/>.

Looking to the future, New York City in partnership with the MTA is also developing new economic strategies to meet the needs of sustainable transportation for the next century. The biggest efforts the city has undertaken have not necessarily been successful but do provide models for understanding how the economics of transportation are changing. The most notable example of a failed but important policy is the 2008 effort to implement congestion pricing with the intention of investing the revenues collected to improve mass transport. Though the programme was blocked by the state legislature the congestion pricing programme suggests how sustainable transportation will be financed in the future.

The paper is organized along a timeline of eras for transit finance in the New York region. The eras of rapid development, unification, creating the MTA, and saving the MTA are discussed with additional detail of some recent successful and failed efforts to ensure the long-term financial health of the MTA. These sections are followed by concluding remarks and potential lessons for other agencies.

## Historical Development of the Current System

### To 1940: Early transit development

The five boroughs of New York (Manhattan, Brooklyn, Queens, Staten Island and the Bronx) consolidated into one city in 1898. At the time of consolidation it was clear that the existing patchwork systems of elevated trains, horse-drawn street cars and electric trolleys were inadequate for dispersing the population of lower Manhattan and promoting growth in the other boroughs. These early transit technologies lead to some land speculation and development on the island all the way north through Harlem, but business interests and politicians were adamant that the city needed faster service in order to shift the patterns of development (Cheape, 1980).

The elevated lines had high ridership for their first few decades and few transportation alternatives existed, then declined in popularity and were increasingly criticized for ruining neighbourhoods through noise, blocked sunlight and other problems (Divall and Bond, 2003). At the same time, most of the outer boroughs – Queens, Staten Island and the Bronx – were largely semi-rural and underdeveloped, though Brooklyn did have an established employment centre and shipping related industries.<sup>2</sup> Civic leaders were eager to develop a mass transit system that promoted decentralization and encouraged development of the outer boroughs. In 1894 the New York state legislature authorized a new Rapid Transit Commission (RTC) that was charged with administering a new rail system for New York City (Hood, 1995).

In 1903 the elevated system was sold via a 99-year lease to the Interborough Rapid Transit Company (IRT), which was contracted to build the first subways in the city (Divall and Bond, 2003). The New York subway officially opened in 1904 and grew rapidly in the years thereafter. The initial concessions were difficult to sell, though subway operations were highly profitable once the systems opened (Lavis, 1915). As Lavis explains, *‘the new lines will be built underground in the more thickly populated sections of Manhattan and Brooklyn and elevated in the outlying districts’* (p. 3). Because of the private operations and restrictions set by the nickel (US\$.05) fare, early subway lines were developed in areas that were already densely developed (King, 2010). The operators, who had no real estate holdings and relied

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2. The Brooklyn Bridge opened in 1883 and greatly improved access to lower Manhattan. The Brooklyn waterfront was also busy with shipbuilding. However, the eastern and northern sections of the borough were largely undeveloped or agricultural.

solely of fare revenues, primarily sought routes that offered high ridership from opening day and could be supported solely through fare revenues.

The first subway line opened in 1904 through a combination of public investment and private operators and the transit system and ridership grew rapidly along with the population of the city for decades. By 1940 the subways had stopped expanding and the system was suffering from outdated fares and overall disinvestment. The city consolidated operations and took over the systems, but financial troubles persisted and New York State moved in the 1950s to aid the struggling transit system, but bitter battles over fare policies and fair ways to pay for transit continued.

Early rapid transit proponents in New York were concerned with maintaining the economic vitality of the city in the face of crushing residential and commercial building densities. Parts of lower Manhattan featured densities of over 39,000 per square kilometre in the early years of the 20<sup>th</sup> century, and Wall Street skyscrapers were placing tremendous strain on the narrow streets below. Sidewalks were shielded from daylight and the crowds of people, horses and other activities congested the area and disease was rampant (Derrick, 2001). Certain reforms tackled the built environment and housing directly as tenement reform was passed and the city's landmark 1916 zoning code was developed to limited building bulk, size and use. Investment in a rapid transit system was part of these reforms and the new subway was seen as a necessary *decentralizing* force that would lower residential densities in parts of Manhattan, support commercial development in the core and promote development elsewhere in the city.

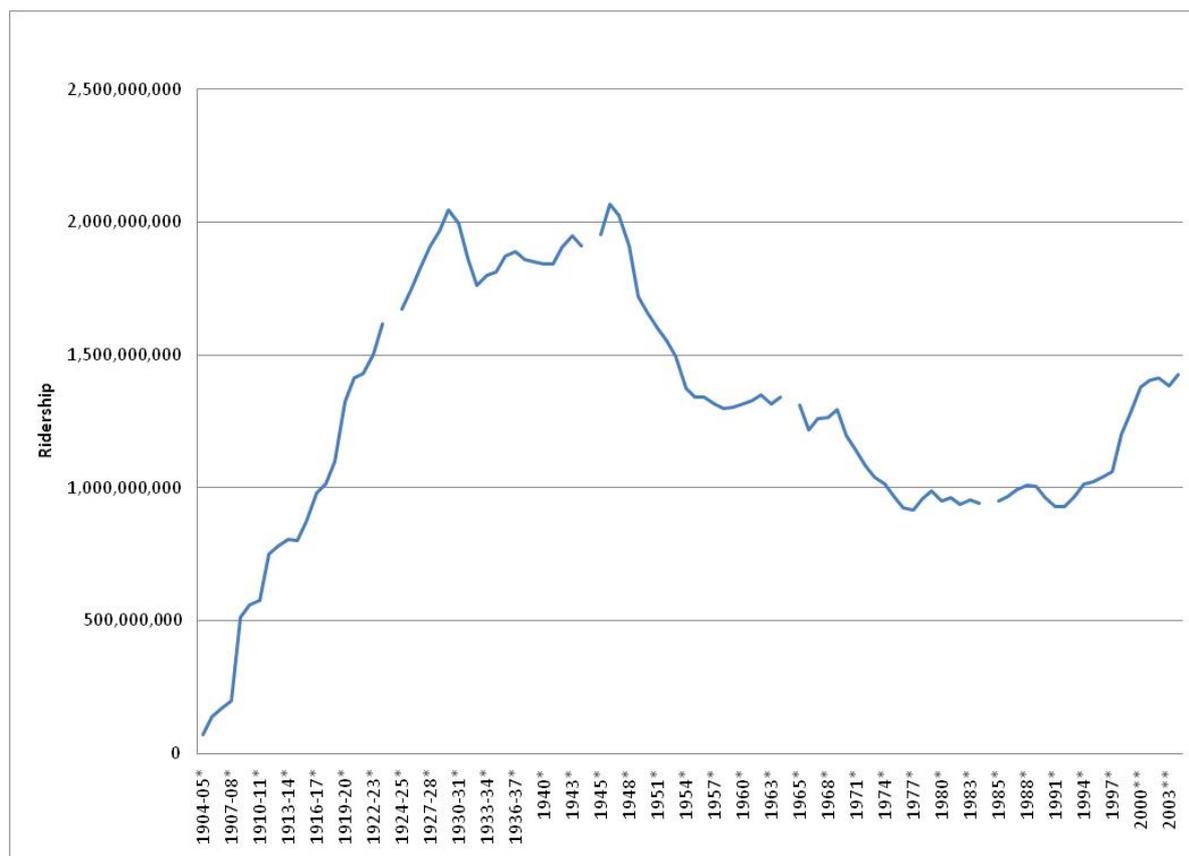
By the late 1910s, it was clear that public transit was competing with automobiles for personal travel. Streetcar lines in the city were losing ridership to subways and automobiles, and auto registrations in New York City jumped from just over 39,000 in 1915 to over 610,000 in 1927 (Schrag, 2000). This was during a period when the subway system was expanding quickly, but the even faster rise in auto registrations suggests that a transit-oriented New York was not destined and that there was potential for the outer boroughs of the city to grow around the automobile. In fact, many areas of the city did develop around the automobile, such as eastern Queens and Brooklyn and certainly Staten Island. But the subways and their nickel fares were viable competitors with cars as long as development in the city supported transit use, and the areas of the city that had robust transit service in 1940 such as Manhattan, western Brooklyn and part of the Bronx, are still transit-oriented today. However, the rapid growth of the system was over and population growth in the city had slowed.

### **1940s: Unification, the five cent fare and financing a mature system**

New York City consolidated the three subway operators in 1940 after years of financial stress. The operators could not deviate from the nickel fares, and ridership declines in the 1930s due to the depression and radical changes to work hours meant that fewer riders were paying. The changes in work hours meant that rather than six-day work weeks with long shifts, unionization and other work rules shifted many workers to five-day work weeks with standardized shifts (Jones, 2008). The loss of Saturday and evening commuting fares coupled with a lousy economy exacerbated already precarious finances for the private operators. The financial system that worked during periods of rapid population, employment and transit system growth was inadequate for maintaining the system once it peaked.

Subway ridership peaked in 1947. Figure 1 shows the subway ridership trends from 1904–2004. The city doubled fares on the consolidated systems in 1948 from five cents to ten cents. This was politically difficult and many viewed this as a violation of the social contract of

**Figure 1. New York City subway ridership by year (1904–2004)**



*Source: MTA, not dated.*

transit. In addition to raising fares, the city pursued new authority to levy taxes for transit improvement (Benjamin and Nathan, 2001). Partisan politics impeded the new taxing authority sought by New York City Democrats, which led to the state taking transit out of the city’s hands by creating the New York City Transit Authority (NYCTA). The NYCTA was managed by a three-member board, where one member each was appointed by the governor of New York State and mayor of New York City, and the third member was selected by the two appointees. This new agency was charged with all operations and was expected to cover operating costs with farebox revenues, but capital investment was still funded by the city.

### **1953–1960s: Creating the modern MTA**

In 1953 the New York City Transit Authority was created to reconfigure the administration and finances of transit operations. The new authority was an attempt to make the transit system financially self-sustainable through farebox collections by achieving economies of scale in operations and management while making transit planning and finance apolitical (Carnegie and Haughton, 1965).

By the 1960s the commuter railroads were also in trouble. New York State purchased the Long Island Rail Road (LIRR) in 1965 as it was teetering with bankruptcy. To manage this asset, the state created the Metropolitan Commuter Transportation Authority (MCTA), which was charged with managing rail, bus, air and ferry services in New York City and surrounding counties (Benjamin and Nathan, 2001). Shortly after the creation of the authority the other commuter railroads (now known as Metro-North) were added to their responsibilities.

Unfortunately, public ownership did not improve the financial condition of the transit systems. The new agencies were limited in their abilities to raise funds for operations and transit ridership continued to decline. Transit was stuck in a vicious cycle of decline where falling ridership reduced the ability of agencies to operate and maintain systems. In addition, planning the city to accommodate the automobile was widely practiced through minimum parking requirements (including requirements in the central business districts of Manhattan) (Altshuler et al, 1979; Ferguson, 2003; Shoup, 2005) and the development of freeways and parkways (Caro, 1974; Brown, 2003).

The main factors that supported rapid development of the transit network were now operating in reverse. Population growth turned to population decline as families moved to the suburbs. Transit gave way to the automobile as the technologically superior mode of travel. The permissive zoning regulations in place during the rapid growth of the city were replaced by comprehensive zoning regulations that enforced single use development and favoured automobiles. These main factors, and many smaller influences, conspired to reduce the financial sustainability of transit at a time when the value of transit to the local and regional economy was poorly understood. While paying for transit operations from farebox revenue was expected, there was little political agreement as to what or how to subsidize transit.

The problems New York City was facing were not unique. Every major city in the United States went through the process of buying or taking over transit operations between the 1930s and late 1960s (Hess and Lombardi, 2005; Post, 2007; Jones, 2008). By the late 1960s there were no longer any major private transit operators in any major US city. In addition to ongoing crises in New York transit agencies' operating budgets, labour unrest came to a head in 1966 when a 12 day transit strike where nearly all service was disrupted. Partly in response to the strike, New York Governor Rockefeller pushed to create the Metropolitan Transportation Authority (MTA), an agency where all transit systems for the city and New York suburban counties could be consolidated (Benjamin and Nathan, 2001). This is the MTA that is in charge of the transit systems today, and the governing structure of the agency is relevant for understanding the MTA's finances.

The MTA board was comprised of members appointed by the governor, and the chairman of the MTA was exclusively the governor's choice. Though the New York City mayor and elected officials in suburban counties nominated representatives, the MTA board was truly a gubernatorial concern. This ensured state involvement in transit finance decisions. At the same time the MTA was created, a new financing stream was developed as the Triborough Bridge and Tunnel Authority (TBTA) – where Robert Moses was the chair – was required to dedicate all surplus revenues to the new transit agency.

The new revenues from the TBTA had a caveat, however, in that the revenues were to be applied equally to operations of subways and commuter rail. This was despite the fact that all of the revenues were generated within the city. At the time, investment in commuter rail was seen as the way to promote transit use as mayors and rail companies argued for federal spending on transit dedicated to commuting (Jones, 1985; Kain, 1999; Jones, 2008).

### **1970s–1990s: The decline and rise of the system: maintenance, fare media and ridership growth**

The MTA has been under financial strain as long as it has been in existence, but the New York financial crises that the city and state faced in the 1970s dramatically harmed the transit agency. The state was suffering from stagnant growth, disinvestment in infrastructure and low levels of public confidence that the politicians could improve the situation. The transit system

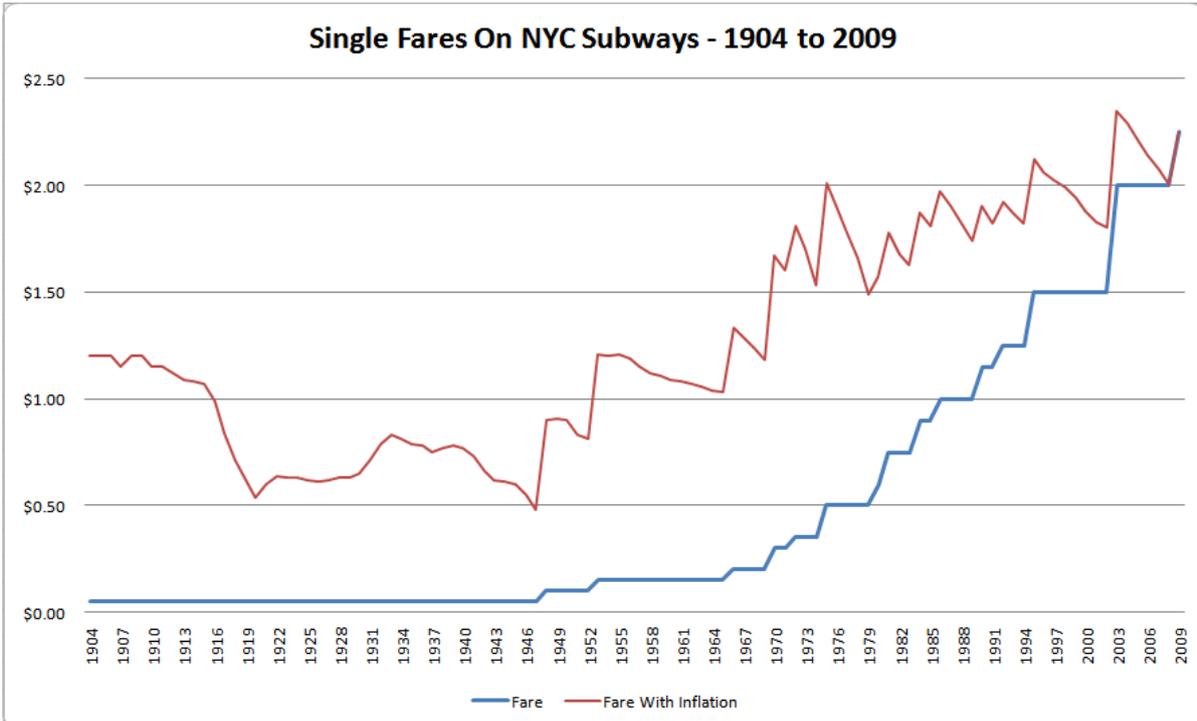
operating losses were being paid largely through the city’s budget, which was an untenable situation. In 1973 New York City Mayor Lindsay pushed for a regional payroll tax to offset the US\$100 million annual costs of the transit system (Danielson and Doig, 1982), though his effort was unsuccessful.

In 1975 New York City was facing imminent bankruptcy while the state was also under difficult stress. The city was emptying out of middle-class families, crime was rising and transit use was declining. Worse yet, the very taxes, tolls and fares that the transit system relied on were all declining so the MTA was hard pressed to maintain operations even without badly needed capital investment. Subway stations and rolling stock were outdated, graffiti-filled and often unsafe.

Fortunately, then Governor Hugh Carey recognized the importance of the transit system for the economic vitality of the city and state and authorized a US\$5.5 billion programme to rebuild the transit system (Lachman and Polner, 2010). Along with the state funding Carey appointed Richard Ravitch as the head of the MTA. Shortly after Ravitch’s tenure started a citywide transit strike stopped the system in April 1980. The strike was settled after 12 days with many changes in the MTA’s finances. The fare was raised to sixty cents, and the state assembly followed through with funding for a major rebuilding of the subway system. In addition, Ravitch pushed for and received a small regional sales tax and yet another fare increase.

While the transit agency has high farebox recovery rates by US standards, relying on farebox revenues alone leave the agency with large operating deficits. Even with regular fare increases the MTA was unable to pay for operations, and fares have generally not kept pace with inflation (see Figure 2). Consider that the nickel fare was in place for the first 44 years of the subway’s existence, but since then fare increases are a regular feature though not equitably distributed. Subway and bus fares were raised seven times between 1980 and 1995, the period of reclaiming the systems from decay and neglect. Yet the commuter rail fares only increased

**Figure 2. Current challenges: 100 years of financial struggles**



Source: MTA, not dated.

five times during this period (Briffault et al, 1998). During the period a shift occurred where subsidies to commuter rail were increasing more than for subway and bus operations.

## **Current Sources of Revenues**

As fares only cover a portion of the required revenue for operations, other sources of revenues and subsidies are required. For operations, the MTA relies on a diverse mix of operating subsidies from federal, state and local governments and a collection of special taxes unique to the region. Most of the special taxes are regional, either through property related taxes, business taxes and employment taxes. Lastly, the TBTA surplus from tolls remains an important part of the MTA finances. What follows are brief descriptions of each of these taxes, followed by two efforts to implement new regional fees for transit through employment taxes and congestion tolls.

The largest single source of subsidy is the Metropolitan Mass Transportation Operating Assistance (MMTOA) account. For the proposed 2011 budget the MMTOA account is expected to contribute US\$1,480 million to the operating costs of the MTA (MTA, 2010). This account was created by the state in 1981 and is funded through four taxes, two of which are regional and two of which are state-wide. The two regional taxes are a 0.25 percent sales tax in the 12 counties in the MTA region and a regional franchise tax surcharge levied on certain business activities within the service area. These two taxes are the majority of the MMTOA funds, but they are also volatile and subject to the condition of the broader economy. As such, these funds are not good sources of stable funding during recessionary times.

The two state-wide taxes are a transportation-oriented tax called the ‘long lines tax’, which is levied on trucking, telegraph and telecommunications companies, and the ‘petroleum business tax’, which is levied on refining or selling petroleum state-wide. These two state-wide taxes are shared across the state, though the MTA gets 48 percent of the long lines revenue and 55 percent of the petroleum tax (Briffault et al, 1998).<sup>3</sup> State taxes tend to be more controversial than regional or local taxes as sensitivity exists that New York City dominates state politics. Though the New York region drives much of the economic activity in the state there is a political need to spread state taxes geographically.

On a regional scale, for the 2011 budget, the MTA projects about US\$380 million in transfers from bridge and tunnel tolls (MTA, 2010). This is about seven percent of the total gross subsidies and about the same amount as the total state and local operating subsidies. These transfers could increase dramatically with the introduction of bridge tolls on the East River and/or congestion pricing.

### **Debt: a new challenge to sustainable finance**

In 2010 about twenty per cent of fares collected by the MTA are used to pay principle and interest on debt payments. This situation is not financially sustainable and partially the result of a shift in the way the MTA uses debt that began in 2002. In that year the MTA refinanced US\$13 billion of outstanding debt as part of a US\$20 billion capital improvement programme. However, the method the MTA used to refinance and the terms they received on the bonds resulted in an increase in the amount that the agency would have to repay (Justice and Miller, 2010). From a financial perspective, refinancing debt under worse terms is problematic, but understood through the rationale of current consumption being valued far higher than future

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3. For year 1995/1996.

consumption, the higher payments in exchange for immediate investment that was desired by customers, politicians and taxpayers are sensible though not sustainable. As Justice and Miller (2010) explain:

*'The 2002 refinancing unambiguously violated the principle of cost minimization, because it increased the amount of interest and fees that have to be paid on and existing debt. However, it also appears to have met other legitimate public goals by doing so, providing some measure of financial certainty for managers seeking to secure adequate and reliable financing for the agency's capital program and permitting voters and ratepayers to achieve their apparently preferred trade-off between present consumption and (their children's) future consumption' (p.318).*

The approach to debt finance that Justice and Miller describe is not limited to transit agencies or the MTA, but certainly challenges a sustainable finance model for New York transit. Unlike the disinvestment in the system seen in the 1950s through 1970s, which was corrected through higher fares and direct public subsidies and management, the system was in a state of good repair when the debt was refinanced. More troubling is that the MTA is explicitly trading a more financially sustainable model for one that pushes obligations into the future without considering what other obligations will have to be met at the time of re-payment.

### **The conditional promise, ultimate failure and resurrection of congestion pricing**

In 2007 New York City and the MTA applied for a federal grant through the US Department of Transportation's Urban Partnership Program to pay for the implementation costs of a congestion pricing project in Manhattan (Schaller, 2010). The bid was initially successful and US\$354 million were conditionally awarded contingent on legislative approval by April 2008 and implementation one year later. The plan would have drivers pay US\$8 to enter the Manhattan core below 59<sup>th</sup> Street, and the net proceeds were expected to generate about US\$31 million annually for transportation investment in the region. As the congestion pricing programme was challenged by public officials and constituents, the parameters of the programme were altered. By January of 2008 the plan included all net proceeds to be devoted to a MTA 'lock box' for capital improvements, a US\$1 surcharge on all taxi trips and some parking reforms within the cordon.

Even though New York had federal money to help implement the tolls and fulfilled many of the prerequisites for successful tolling programmes – such as a robust transit network, small share of travellers who would be subject to the tolls and ready-made recipients of the toll revenue – the measure failed in the state legislature and the federal money was reallocated to Los Angeles and Chicago (Manville and King, forthcoming). The political opposition somewhat surprisingly came from New York City legislators; however, these officials represented some of the most auto-oriented sections of the city. One major concern was that even though toll revenue was promised to the MTA, there was little confidence that the money would be spent wisely or in ways that benefited the aggrieved constituents. Manville and King have identified such concerns as a credible commitment problem that is widespread in transportation finance (Manville and King, forthcoming). Because New York City needed to gain approval from the state legislature to implement pricing, the credible commitment problem was made worse.

One of the problems the New York congestion plan faced was the decision to give the net revenues to the MTA came after the public had largely decided about the plan and opposition had galvanized. Had the revenue been promised locally and transparently initially, partially solving the credible commitment problem, the measure would have had a better chance of

passing. A primary driver of political acceptance of tolls is how the money is spent (King et al, 2007), and as the MTA has strong and broad support in New York it is a worthy recipient of toll revenue. As of January 2010 there is new interest in reviving congestion pricing specifically to fund transit, though it is now called ‘traffic pricing’ (Lisberg, 2011).

## Conclusion

Transit finance in New York City has always been precarious. In the early part of last century as the system was rapidly expanding paying for operations through farebox revenues was adequate, but lines had to be profitable as soon as they opened. Once the city grew up around the lines there was little the transit companies could do to maintain and improve the system while stuck with nickel fares. Ridership and revenues declined, which made the financial stress on the private operators worse and lead directly to the city taking over operations.

Public ownership proved no better at operating transit ‘profitably’ and early attempts at broadening the scope of transit revenue sources were unpopular, as were the inevitable higher fares. Eventually a regional agency was created with multiple sources of revenue from tolls, fares, sales and business taxes and property transfer fees. Unfortunately these sources of revenue tend to be as volatile as the business cycles, leaving the MTA in poor financial shape when the public needs their services the most. The search for sustainable finance continues.

Ultimately, this case is an important history lesson for transportation economics in a city with one of the world’s oldest metros and recent vintage freeways and bridges. It describes historical and current efforts by public officials to substantially alter how money is raised and invested. The economic health of the metropolis has always been reflected in the health of its transportation systems. The future well being of New York is going to be directly tied to the success of the new policies intended to meet the needs of future populations for environmentally, socially and economically sustainable urban transport.

## References

- Altshuler, A. A., J. P. Womack and J. R. Pucher (1979) *The Urban Transportation System: Politics and Policy Innovation*, MIT Press, Cambridge, MA
- Benjamin, G. and R. P. Nathan (2001) *Regionalism and Realism: A Study of Governments in the New York Metropolitan Area*, Brookings Institution Press, Washington, DC
- Briffault, R., E. Sclar and W. Hook (1998) ‘Fairness and the fare: Equity and adequacy in the financing of the operating agencies of the Metropolitan Transportation Authority’, A study and report undertaken pursuant to the agreement in *New York Urban League v MTA*, Legislative Drafting Research Fund, Columbia Law School, New York
- Brown, J. (2003) ‘A tale of two visions: Harland Bartholomew, Robert Moses, and the development of the American freeway’, Transportation Research Board Annual Meeting, Washington, DC
- Carnegie, J. and J. Haughton (1965) ‘...to the point of peril: A look and the New York City transit authority’, New York City, Rank and File Committee Transit Workers Union
- Caro, R. A. (1974) *The Power Broker: Robert Moses and the Fall of New York*, Knopf, New York
- Cheape, C. W. (1980) *Moving the Masses: Urban Public Transit in New York, Boston, and Philadelphia, 1880–1912*, Harvard University Press, Cambridge, MA

- Danielson, M. N. and J. W. Doig (1982) *New York, the Politics of Urban Regional Development*, Published for the Institute of Governmental Studies and the Institute of International Studies [by] University of California Press, Berkeley
- Derrick, P (2001) *Tunnelling to the Future: The Story of the Great Subway Expansion that Saved New York*, New York University Press, New York
- Divall, C. and W. Bond (2003) *Suburbanizing the Masses: Public Transport and Urban Development in Historical Perspective*, Ashgate, Aldershot, Hants, England; Burlington, VT, USA
- Ferguson, E. (2003) 'Zoning for parking as policy innovation,' *Transportation Quarterly* **57**(2): 47–55
- Hess, D. B. and P. Lombardi (2005) 'Governmental subsidies for public transit: History, current issues, and recent evidence,' *Public Works Management and Policy* **10**(2): 138–156
- Hood, C. (1995) *722 Miles: The Building of the Subways and How They Transformed New York*, Johns Hopkins University Press, Baltimore
- Jones, D. W. (1985) *Urban Transit Policy: An Economic and Political History*, Prentice-Hall, Englewood Cliffs, NJ
- Jones, D. W. (2008) *Mass Motorization and Mass Transit: An American History and Policy Analysis*, Indiana University Press, Bloomington
- Justice, J. B. and G. J. Miller (2010) 'Accountability and debt management: The case of New York's Metropolitan Transportation Authority,' *The American Review of Public Administration* **41**(3): 313–328
- Kain, J. F. (1999) 'The urban transportation problem: A Re-examination and update', in J. R. Meyer, J. A. Gómez-Ibáñez, W. B. Tye and C. Winston (eds) *Essays in Transportation Economics and Policy: A Handbook in Honour of John R. Meyer*, Brookings Institute Press, Washington, DC, pp359–401
- King, D. (2010) 'Developing densely: Estimating the effect of subway growth on New York city land uses', paper presented at the 12th World Conference on Transportation Research, 11–15 July Lisbon, Portugal
- King, D., M. Manville and D. Shoup (2007) 'The political calculus of congestion pricing,' *Transport Policy* **14**(2): 111–123
- Lachman, S. and R. Polner (2010) *The Man who Saved New York: Hugh Carey and the Great Fiscal Crisis of 1975*, Excelsior Editions/State University of New York Press, Albany
- Lavis, F. (1915) *Building the New Rapid Transit System of New York City: An Historical Reprint of the Engineering Accounts in Building the Dual Contract Lines for the City of New York*, Xplorer Press, Belleville
- Lisberg, A. (2011) 'Congestion pricing still on board as politicians resurrect plan to charge drivers entering city' *Daily News*, New York
- Manville, M. and D. King (forthcoming) 'Credible commitment and congestion pricing'
- MTA (Metropolitan Transportation Authority) (2010) 'MTA 2011 Final proposed budget: November financial plan 2011–2014, volume 1', New York
- MTA (not dated) 'Subways facts and figures', <http://www.mta.info/nyct/facts/ffsubway.htm>, last accessed 15 June 2011
- Post, R. C. (2007) *Urban Mass Transit: The Life Story of a Technology*, Greenwood Press, Westport, CT
- Schaller, B. (2010) 'New York City's congestion pricing experience and implications for road pricing acceptance in the United States,' *Transport Policy* **17**(4): 266–273
- Schrag, Z. M. (2000) "'The bus is young and honest", Transportation politics, technical choice and the motorization of Manhattan surface transit, 1919–1936,' *Technology and Culture* **41**(1) 51–79
- Shoup, D. C. (2005) *The High Cost Of Free Parking*, Planners Press, American Planning Association, Chicago