Capital Investment Priority – Setting for Transit in Large Metro Areas

Jeffrey M. Zupan, Senior Fellow, Regional Plan Association
Richard Barone, Director of Transportation Programs, Regional Plan Association

Transit agencies must spend their scarce capital funds judiciously. The investments they make must be targeted to keep and attract riders, maintain a large and complex network to insure its dependability, and to anticipate and serve growing markets, all the while keeping the public trust that the public's money is well spent. When the needs are greater than the funds available, which is often the case, the choices become still more critical; to make one investment may preclude another. These choices have many dimensions. Repair the system or upgrade it; expand the network to serve new or underserved markets or focus only on the current network; replace a component that might fail at some distant time or take the risk of delay; satisfy one constituency at the expense of another; invest in one mode but not the other; introduce a new technology or stay with the current one.

This paper sets out to discover how major transit agencies make their choices about spending their available funds to maintain, upgrade, and expand their systems. Although it is difficult to generalize based on the sample of eight agencies examined in this paper, particularly given their many and varied characteristics, it may still be possible to draw conclusions that could be applied to other transit systems.

The agencies interviewed for this paper operate in widely varying environments, government settings and responsibilities with respect to their formulation of their transit agencies' capital spending program and priorities. The agencies surveyed serve metropolitan areas ranging in population from less than two million to 25 million. Some have systems built in the last 20 years, while others are responsible for transit systems built early in the 20th century. Some are in charge of both transit and highways in their region; others control only transit, and still others operate some modes of transit but not all. Some of the interviewees are government entities that oversee the transit operating agencies at a policy level but do not operate the systems, while others both formulate policies and operate the system. Still others are set up to be private profit-making institutions. Some are transit agencies that make the decisions about system expansion, while others are directed by a different general-purpose and higher government entity. A few agencies have stable and sufficient funding, while others do not. As might be expected, these differences carry over into how they address the process of capital priority decision-making.

The questions addressed in this paper include:

➔ How do the agencies organize themselves internally to make decisions about their capital program?

➔ How do the agencies integrate the planning of transit and land use development in their decision-making process?

➔ What is the process for gathering input from external parties – interest groups, public officials, and the general public – regarding the capital program?

➔ What are the sources of funding for the capital program and how does that affect the decision-making process?

➔ What is the process for considering expansion investment, and how is that distinct from the process of deciding about projects and programs that address the needs of the existing transit system?

➔ Is there a formal system of rating or ranking projects, and is it based on qualitative or quantitative analysis?

To address each of these questions, the material collected from the agencies was culled to provide some representative practices. This material is not intended to be exhaustive, but rather to highlight different approaches where they exist, and to prompt a discussion. In the final section, the themes that emerge from this review are highlighted.

Internal Organization for Capital Priority Setting

The governance structure in each of these metropolitan areas is distinct, and has a bearing on the transport decision-making process. In some cases the decision-making process is more centrally located within the highest level of government, such as the country or city/state, and in others the decision-making is more decentralized, with the transit operator having more latitude about where it directs its capital investments. However, in all cases there is at least some control of the choices made at a level higher than the transit operator. And in all cases the choices about system expansion investments are made at a more centralized level than investments in maintenance, repair, replacement and upgrading projects.

All the agencies have a process for establishing a capital program for the short and longer term. Typically, the short-term program is developed and revised annually, and the long-term program, which is revised less often, is for five years or more. Some base the program on a longer-term vision. Hong Kong's capital program covers a period of 50 years. Washington has a vision plan for 2025 and then beyond to 2040. Singapore has a long-term Master Plan keyed to its projected cash flow of ten years. Seoul has a ten-year urban rail plan. Montreal has a ten-year strategic investment plan with a vision statement, goals and

objectives. New York uses its 20-year capital needs assessment to drive its five-year capital program. Vienna relies on its five-year capital program.

As might be expected, all the agencies have an internal management process to collect information to be able to pool all the possible elements of the capital program. Each has internal staff committees to consider the proposals; each places the decision-making in the hands of the top executive; and each seeks the advice and consent of its board or similar group. Each agency has an external process for gaining input to the capital program from the stakeholder groups, local governments and from the general public, and each vets the resulting program with these groups.

➔ Hong Kong relies heavily on an internal process. Mass Transit Railway's program is developed by its Capital Works Budget Vetting Committee, which is chaired by the head of Operations Strategic Business Management, with representatives from all line and support departments. MTR's shorter-term program is reviewed by the Operations Director, and the longer-term program is reviewed by both the Operations Director and Finance.

➔ A business plan covering a ten-year period and updated annually guides Transport for London's capital program. Its board is chaired by the mayor of London. Accordingly, its priorities are guided by the mayor's transport strategy, which lays out the strategic direction of TfL; TfL's business plan then sets the corporate strategies to achieve the mayor's goals. The capital program is established through submissions of the operating subsidiaries to the leadership team, which is chaired by the commissioner and made up of representatives from Finance, Planning, Communications, the legal department and the operating agencies. The decisions are based on consensus.

➔ In contrast to London, the New York Metropolitan Transportation Authority's capital program does not emanate from a grand vision, but from a "bottom-up" 20-year needs assessment that is organized by more than 100 asset categories, each with its own strategic plan. This is done by each of the modal operating agencies. A major influence on this assessment is consideration of the useful life and risk of failure of the infrastructure. The 20-year needs assessment process tends to be constrained by operational concerns and the agency's historic capacity to do each work element. This is a particular challenge for the 24-hour operation of the subway system. Fiscal constraints may further affect the needs assessment. From the 20-year needs, a five-year capital program is developed and usually updated annually, based on a more realistic assessment of available funds. This is done with guidance from the MTA umbrella agency, including consideration of impacts on the agency's operating costs. The shares allotted in the program to each operating agency are largely predetermined based on history and the need to balance city and suburban interests, so the funding received by each agency may not be in proportion to where need is greatest.

Integration of Land Use Development and Transit Planning

Hong Kong and Singapore are two very dense and confined city-states with substantial resources and a well-planned integration of transit and land use development. Their networks are relatively new, and they are expanding despite their limited quarters; they act on and benefit from the mutually supportive link between transit and land use. The linkage between the two is well understood by transportation professionals, but not fully appreciated by the general public. Often, the decisions on transit priorities and on land use development are not made by the same people, or even people with similar motives, leading to sub-optimal investments. In an ideal world these decisions would be made hand in glove, and the relatively best practice in of these two metropolitan areas would be followed elsewhere. However, each of these two metro areas has the advantage of a centralized government. Moreover, the confined regions in which they operate force them to be efficient in the use of their limited land areas. In most other places the constituencies are more diverse and their land use options are less limited, which can lead to a mismatch of land use and transit service. It remains a challenge as to whether the "best practice" found in both Hong Kong and Singapore can find its way to other less constrained environments.

External Input and Communication

All the agencies have some form of information gathering from groups outside of the agency. Some are more elaborate and inclusive than others. Those that have a more substantial process seemed to be pleased with it, observing that there can never be too much interaction with the public and with stakeholder groups to gain their trust and ultimately acceptance of the decisions made.

→ Input to Hong Kong's capital program comes from legislative bodies, stakeholder groups and from the public through many formal and informal channels, including customer service research, a customer service hotline, an "Opinion Zone," a radio program, liaisons with district councils, etc. The customer research consists of some 50 projects to get responses from the public on agency performance, travel behavior and other areas to identify room for improvement. All the channels are fed to the Customer Service Steering Committee, and then to the appropriate internal departments for evaluation.

→ Because Washington, D.C.'s transit system serves the nation's political center, it is the recipient of attention (and ultimately resources) beyond the usual local constituencies. And, because of the constant tension for resources among its three local governments representing city and suburb, as well as two distinct suburbs in two states, Washington Metropolitan Area Transit Authority has been compelled to find a way to not only defend its decisions, but gain broad consensus for them. The process WMATA has created has broad stakeholder buy-in and agreed-upon mission, goals and objectives. The elaborate process has enabled WMATA to navigate the shoals, not without considerable effort, of the disparate political and geographic divisions found in its region. This model can certainly be applied even in locations with less diversity.

→ The WMATA process relies heavily on an extensive system of outreach and feedback that is marked by a variety of mechanisms used to reach the stakeholders and the riding public. Central to all communication is the presentation of *Momentum*, the strategic plan framework for the agency that guides its capital program, and is found on its website. In addition to WMATA's website, the agency is present on MindMixer (a dedicated online forum which poses questions for discussion), Twitter and Facebook. A forum with online links was hosted by the region's leading newspaper. Materials are developed for presentations in multiple languages, and a variety of venues are used, including libraries and houses of worship. Presentations are made to many governmental units, rider groups and other stakeholders. Highlights of the feedback received:

- From customers: Provide better in-system information, better amenities, more off-peak service and reduced crowding.

- From employees: Protect our assets.

- From public officials: Fix the funding problem.

- From the business community: Help the region be competitive.

Funding and Decision-Making

The sources for capital funding are reflective of the governance structure and the relationship of the metro area to the nation. Some are more self-reliant, either because they are profitable, are self-contained governments, or raise enough through local taxes. The three Asian cities fall in this category. Others depend on where they fit within the government structure around them – a predominant city in a province or nation, a nation's capital or part of a very complex metropolitan area. The tensions between the larger governmental units and the metro area often come into the picture.

➜ London and Seoul have in common the heavy influence resulting from their political structure; London's entire transport network is the responsibility of its mayor, who sets the mission and overarching agenda; Seoul's system is overseen by its metropolitan government. London nicely integrates the objectives of its mayor into its capital decision-making process, as does Seoul. This suggests that a system where a strong mayor with transportation responsibilities can be a successful model. Of course, this depends on whether the vision of one individual is the "correct" one; a government leader who emphasizes roads and auto travel over transit can be disastrous "worst practice" for transit. In Seoul, transport funding comes from taxes on gasoline and diesel levied by the Seoul Metropolitan Government, and is used for both the road and transit systems. A tax is also imposed on land and buildings within the transit district, with 10 percent of that tax used for parking facilities. Expansion of the system is funded with a subsidy from the central government.

Singapore's Land Transport Authority and Hong Kong's MTR are also dependent on the central government, but, as we have stated here, in these two places the metro area and the central government are one and the same. The LTA's funding comes directly from the national government, with the individual investments subject to the approval of the central government of the city-state.

➜ In the city-state of Hong Kong, the funding levels are determined internally, aided by the MTR's profitability. Funding levels are decided according to its cash flows and borrowing power. MTR's 2011 operating profit was over $2 billion, and it funds the capital program. MTR is the decision-maker when it comes to most investments, but for expansion projects there is close consultation with the Hong Kong government.

➜ Montreal and Vienna must rely to a large extent on the next highest level of government for their funding. Here, there can be a conflict between decision-making and funding if the higher level of government is not in tune with the operating transit agency's needs and priorities. Montreal does have strong provincial support, consistent with its position as the largest city in Quebec. Decision making is an internal process with representation from the major department, and guided by a 10-year strategic plan, which is used to develop a three-year investment plan. The process is informal and involves negotiation at the local and provincial level. A more formal prioritization process is under consideration.

➜ In Vienna, Wiener Linien relies on national funding for half of its expansion funding, the rest accrues from local taxes. The decision making process is similar to the one described for Montreal, with representation from major departments and with input from a variety of sources, included towns affected by their services, the national government and local stakeholders.

➜ New York also has a "disconnect" between operator and funding sources. It is by far the nation's largest transit system, and has capital needs that outstrip available funding levels. This is compounded by the MTA service area being located in downstate New York, while it must seek funding from government that serves the entire state. The Governor and a committee of the legislature have veto power. Bonds backed by fares, dedicated tax sources and federal formula contributions pay for its capital program. While direct state aid is relatively small, the governance mechanism gives much of the control of the program's size to the state, although the choices for most of the priorities are left to the operator. The positions it must take are to first protect its aging assets and reduce risk as much as possible. System modernization upgrades, such as new fare payment systems and other new technologies, can only be deployed over extended time frames. This drives much of the capital decision making down to the operating level, where the detailed knowledge of the system is found. This is appropriate as long as funding is in very short supply. The downside is the system upgrades projects get short shrift. By contrast, expansion projects are decided upon at a higher level, influenced for better or worse by a host of players and factors, though the MTA plays a role in documenting the need for such projects. But they, too, are inevitably delayed when funding is tight and day-to-day maintenance affecting safety and reliability are forced to take precedence.

➜ WMATA's sources for capital funding are heavily influenced by two factors. First, Washington, D.C. is the nation's capital, which leads to greater funding participation of the federal government. Second, the transit agency's service area, which includes the city itself and the surrounding suburbs in two states – Maryland and Virginia – results in strong participation by each. The six-year capital program is updated each year, aided by an agreed-upon formal evaluation process that helps reduce conflicts about priorities. It is described elsewhere in this paper.

System Expansion

To varying degrees, the capital programs for the transit agencies have separated the evaluation and decision-making for expansion projects from decisions about investments in maintenance, replacement and system upgrades. There are good arguments whether this is the best approach. The argument for separation asks whether it is wise to add a wing to your house while the roof is still leaking. After all, if the existing transit system is unreliable and unattractive, it should be fixed first before expansion is considered. This side argues that investments in expansion are very expensive, and if resources are scarce, then investments in the existing system will necessarily be shortchanged.

System Expansion: MTA Capital Construction Costs

Julia Vitullo-Martin, Senior Fellow, Regional Plan Association

New York City's public transit system is not only one of the largest in the world by ridership and scope, it is also administered by one of the most complicated governance systems—a factor that profoundly affects how, why and what it decides to build.

New York's elevated trains and subways long predated the state-created Metropolitan Transportation Authority that now oversees them. As the agency in charge of implementing a unified mass transportation policy for the city and its suburban region since 1968, the MTA coordinates the work of seven once-independent operating agencies (legally: "The Related Entities"), each of which has its own capital program and construction department to manage routine capital work.

The MTA itself is governed by a 17-member board that is structured to represent its service areas—the city's five boroughs and seven surrounding counties—as well as the MTA's full range of significant interests and stakeholders. (See main text for more details.)

The MTA is not the only agency managing and building public transit in New York—there is also the Port Authority of New York & New Jersey, which runs the PATH trains from the World Trade Center and Manhattan's West Side through the Hudson Tubes to New Jersey cities, for an average 242,000 passenger trips every weekday, a small fraction of the MTA's 8.4 million daily.

The construction of megaprojects has been fraught with issues of cost and timelines for both the MTA and PANYNJ. The MTA's solution in 2003 was to create the MTA Capital Construction Company to manage the system's expansion (Second Avenue Subway, East Side Access, 7 Line Extension to Far West Side), as well as Lower Manhattan infrastructure projects, which include the MTA's South Ferry Terminal and Fulton Center. Both of these are near the PANYNJ's World Trade Center rail hub, which is at least eight years behind schedule and $2 billion over budget. MTACC also manages MTA's security-related capital construction.

New York's public transit operates in a highly complex, competitive and political environment. Even in the best of times, transit executives are seldom left alone to make major capital decisions as they see fit based on neutral, analytic criteria or engineering standards.

Why Does It Cost So Much And Take So Long To Build In New York?

New York cannot function without its subway, and while most New Yorkers understand this, they tend to balk at expansion of the system, in part because of the extraordinary costs, delays in delivery and years of broken promises. By almost every criterion, it costs more to build in New York City than in its fellow world cities such as Hong Kong or Tokyo, or even major but smaller American cities, such as Washington, D.C. or Los Angeles.[1] While the cost per track mile for London's Crossrail is closer to the three New York City projects, it includes nine large new underground stations constructed in a very dense urban environment that are tightly integrated with existing tube and commuter stations; the projects must proceed without seriously disrupting the existing transit services.[2] But what if New York's costs were seriously analyzed, and waste and redundancy pared to the bone, freeing up resources for additional building? MTA executives and other experts have many ideas how to do this.

Urban environment—and its required mitigation measures—may be the most important single contributor to cost increases over reasonable estimates. Projecting costs in New York requires anticipating the regulations and vagaries of the urban environment—hourly restrictions that mandate construction within a 7 a.m. to 7 p.m. period, relocation of utilities (often more than once), remediation of older buildings, and treatment of redundant power substations even when not necessary. Most serious, the federal- and state-mandated environmental impact statements are more often than not written without regard to consequences, casually imposing unwarranted limitations on construction that will cost the taxpayers millions of dollars.

Recent MTA megaprojects have started the community outreach too late, which has resulted in the need to change scope previously defined, slowing projects and adding costs. The obvious action is to start earlier, as London did, which the MTA has learned the hard way.

Because labor costs constitute 65 percent or more of major projects, any attempt at cost efficiencies must include labor savings—but labor reforms are often the most political and controversial of all, even in clear-cut instances. The MTA, for example, must use 30-40 workers on a tunnel-boring machine, versus in Europe, where six to eight will do. The Second Avenue Subway expense per tunnel-boring machine is about $70K/shift or $200K/day.

1   Source: Interviews with MTA executives who have been tracking capital construction costs in relation to those of other systems. The MTA hopes that its estimated costs of $800,000 per km for the 7 Line Extension hold, which would bring it in under London's $1 million plus per km for Crossrail. But this remains to be seen. As it is, the analytic web site Pedestrian Observations (pedestrianobservations.wordpress.com) calculates East Side Access at $4 billion per km, Second Avenue Subway at $1.7 billion per km, and the 7 Line Extension at $1.3 billion per km. It sets Crossrail substantially lower at $1 billion per km. All capital cost projections for public transportation are rough and almost never strictly comparable.
2   Crossrail Website, 'Route, stations'. http://www.crossrail.co.uk/route/stations/

Table 1: Domestic and International Comparison of Metro Construction Costs

City	Project	Track Miles	Cost	$ / track mi	Structure
New York	7 Line Extension	3	$2,100,000,000	$700,000,000	Tunnels
New York	East Side Access	6.28	$10,718,000,000	$1,706,687,898	Tunnels
New York	Second Avenue Subway Phase I	3.6	$4,450,000,000	$1,236,111,111	Tunnels
Washington, D.C.	Silver Line	46	$3,000,000,000	$65,217,391	Elevated/at-grade
Los Angeles	Purple Line	18.8	$6,300,000,000	$335,106,383	Tunnels
London	Crossrail	26.10	$24,272,000,000	$930,047,849	Tunnels
Paris	M12 Line	3.73	$256,065,000	$68,682,800	Tunnels
Hong Kong	Shatin to Central Link	21.13	$8,437,000,000	$399,354,104	Tunnels
Tokyo	Fukutoshin Line	5.53	$2,394,601,200	$433,004,300	Tunnels

Source: MTA and other transit agencies

New methods of construction are often blocked in New York either by code or by union contract or both. The MTA has evaluated some technologies used by others that have potential for reducing costs in New York. Conversely, the MTA is also aware that some of its old, very costly methods of construction are used less frequently elsewhere—for example, the practice of coating attractive-looking bedrock with concrete, rather than leaving it exposed as an amenity, as is done in Stockholm and some other European cities.

New institutional arrangements for construction show that it is possible to build cheaper and faster. The extension of the MTA's 7 Line subway,[3] for example, was accomplished efficiently in part because the Hudson Yards Development Corporation constantly monitored progress and expenses. Established in 2005 to implement the Hudson Yards development plan, HYDC pushed and negotiated with all partners—public and private—to ensure completion. As one MTA official summarized the partnership, "HYDC brought a higher level of focus and intensity to the job. They had both the developers and City Hall behind them. City Hall being so interested gave the project more muscle." This kind of public-private partnership, especially one initiated by City Hall, shows great promise.

Similarly, London's immense 73-mile Crossrail is being built by a company, established in 2001, that is owned by Transport for London, but able to secure separate private-sector partner funding.[4] Because TfL itself is answerable to the mayor of London, Crossrail is automatically analogous to HYDC. In both cases, the original organization dissolves once the project is built and turned over to another group for operations.[5]

This may be an especially auspicious time for public transit in New York. The MTA has been able to demonstrate substantial operational improvements over the last few years, particularly those visible to the public. It has, for example, cleaned up the trains, installed countdown clocks, provided subway and bus time apps, and introduced a number of innovations no one had predicted. Breakdowns are far fewer than in the past, and most trains run fairly close to schedule. On the capital front, the MTA has been successfully repairing huge segments of the system, and is about to complete and open two capital expansion projects— the 7 Line Extension and Fulton Center. Thus, its record of recent achievements positions it well for seeking additional funding, both government and private sector. Identifying ways for the MTA to significantly reduce its costs and increase its efficiency will enable the agency to build more, which will be essential to facing the dual challenges of global competitiveness and growth.

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3   A 1.5 mile extension of the 7 line from its existing terminus at 8th Avenue and 41st Street to 11th Avenue and 25th Street, with a new terminal at 34th Street that will service an estimated 35,000 passengers in the peak. The project will cost $2.1 billion and will be completed in early 2015.

4   Crossrail website: About Us. http://www.crossrail.co.uk/about-us/
5   Crossrail Articles of Association, March 2014.

The other side of the argument points out that expansion is just another way of making the existing systems more attractive by adding capacity where congestion exists, adding connections to existing services and offering new services to areas without them. These benefits cannot wait until all the maintenance and repair is fully in place, and, moreover, these repairs are a never-ending process that will forever preclude needed expansion, which can provide the opportunity for economic growth by opening up areas that are transit inaccessible.

Complicating the issue is the fact that expansion projects and other investments are difficult to compare using the same criteria and metrics. Economic development, congestion relief, new service coverage and more sustainable land uses may be the criteria for expansion, while investments in the current system address issues of reliability, safety, risk and service life. This suggests that it may not be possible to create a system that allows for comparisons of both expansion and other investments using the same evaluative tools. In practice, where there is a prioritization process the two are separate, in large measure because the funding sources are different.

→ For Singapore's LTA and Vienna's Wiener Linien, decisions to proceed with expansion projects must meet some minimum thresholds. For the LTA, expansion projects must meet two criteria: financial viability and economic viability. To meet the more narrow financial viability criteria, the project must be able to cover its operating costs and the costs of depreciation of the asset through the revenue it attracts. The second criterion is economic viability threshold, where the project's economic benefits to the region and the riding public must equal or exceed the total costs of the expansion project. Once both criteria are met, LTA seeks government approval to fund and implement the expansion. In Vienna, the threshold is measured by ridership; if it meets the ridership criterion of 10,000 passengers per direction in the peak hour in the most heavily used section, and it can provide needed capacity to substitute a metro for a tram line that is at capacity. Then, a project moves ahead once the city of Vienna guarantees the 50 percent match, at which time the federal share is also committed.

→ The process is more complicated in New York, where the availability of funding takes precedence. Expansion projects compete for federal "new starts" money with many projects nationally. The funds cover up to half of the cost, and without which the project would not proceed. A project must score well in areas of cost-benefit ratios, environmental impact and a number of lesser criteria, running the gantlet of complex analyses. Projects not only must compete well against the political competition nationally, and have approval locally, but also be looked on favorably by an array of influential local stakeholders, including the governor, the mayor, the New York State legislature and public interest groups. One exception to this process has been a project funded by New York City via a tax increment financing mechanism. In addition, the MTA also secured federal funds in the wake of the 2001 terrorist attack to assist in the construction of two major station complexes in lower Manhattan.

Priority Setting Process

The process of deciding on which capital investments should be advanced varies by agency. Some receive and are influenced by an elaborate process of customer input. Others have a different process. Each is influenced by its history and the culture in which it operates. The more rigorous agencies combine qualitative and quantitative criteria, as in Hong Kong, Washington, D.C. and London, while others are more strategic at the operating level, as in New York. In Hong Kong and Washington, D.C., an elaborate and thorough system of getting input from citizens helps to gain support, and can often guide the choices to be made. All methods have common criteria, often expressed differently, yet work their way into the process. These include safety (and security), better service on existing facilities (which can take the form of maintenance of the existing network to ensure reliability), more service, more ancillary services and amenities, wider transit access, greater mobility and choice, expanding service to growth areas, cost-effectiveness and support of the region's economy.

→ Hong Kong projects are prioritized by a value assessment process that divides the projects into asset upkeep, improvements, and initiatives that have a commercial revenue payoff. It is based on seven corporate business objectives, some quantitative and some qualitative in nature. The resulting evaluation places the project for each of the objectives in either a significant, beneficial, measurable or marginal category.

→ TfL has a process that works back from outcomes (objectives) collectively known as the Mayor's Transport Strategy, which are then nested under the three broad objectives established by TfL: keep London working (reliability and crowding), keep London growing (capacity, regeneration, job access), and make life in London better (safer). Projects are scored against these objectives and checked back against TfL's strategic pillars – customers, staff, mayor and value.

→ WMATA prepares an unconstrained capital needs inventory. A leadership team develops consensus "weights" for the four goals provided, then scores how each of the strategies meet the goals. Department heads score each project. A theoretical example of how this might be scored by one individual is provided in the Appendix A. This system does not explicitly account for the cost of the project, but it includes a "return on value" concept.

Those agencies with more rigorous processes are pleased with them. They admit they require more time and can be onerous, but they express belief that the extra effort is worth the expenditure of time and resources. They believe that a rigorous process leads to greater buy-in internally, which in turn leads to a more productive work force acting as a team. And it leads to greater acceptance externally, because stakeholders and the public come to recognize that the process is not an arbitrary one. However, even this rigor

is occasionally overridden by compelling priorities, such as the project in Hong Kong to provide transit access to their new airport.

New York has a no less rigorous process at the asset category level, but has a more intuitive one when choices among assets must be made.

Some agencies have a formal evaluative process used as a guide, but rely on a collaborative leadership team to reach decisions. Others have a less formal and more decentralized structure tied to a vision that guides their priorities. Montreal, New York and Vienna are receptive to a process that would be more rigorous and structured, and express dissatisfaction with the absence of a process. Each is buffeted by outside forces. Some agencies, such as New York, are in a perpetually scarce funding environment and must safeguard the transit system first. Hong Kong, Seoul and Singapore have more leeway because they are more financially secure. Some are more directly influenced by the political structure or their funding sources, including Montreal, Vienna and New York.

Findings and Emerging Themes

There is not one way to decide on capital priorities for a transit agency. Some establish an elaborate quantitative process, while others are purely qualitative. Some seek public input, others hardly at all. Some have a very centralized leadership structure to make decisions, while others are more decentralized. Some are buffeted by political forces, others much less so.

This investigation suggests that having a process of some kind is of great value. It can stimulate rational thinking, create transparency, avoid arbitrary decisions, increase efficiency and effectiveness, and limit unwarranted influences. There are bound to be many major cities and transit systems, each spending huge sums, that have a less evaluative process for making transit investment choices, and would benefit in these ways. And there are a number of models to choose from, only some of them discussed here. Key features can include acknowledgment of the land use-transit connection, open two-way communication with the public, strong central leadership and a structure that more closely links the funders with the operators. Whether all these features can be incorporated in each situation is problematic for reasons of culture, history, government structure, funding availability, and size and type of transit needs.

The arguments for a formal and open process for decision making are strong. It forces the agencies to collect and examine data thoroughly; it inoculates the agency against criticism for making arbitrary decisions; it causes greater introspection among managers. On the other hand, it requires much more work. It can breed resentment among line managers and operating departments, who may believe decisions are made too bureaucratically, and by people who know less than they do about daily operations.

An agency that recognizes the two-way, cause-effect relationship between transit service and land uses can better tailor its capital investment program to the growth in its metropolitan areas. This linkage is well established in Hong Kong and Singapore, but not elsewhere. In these two confined city-states, it is imperative to consider this linkage; it may be less true in other places.

Agencies with an open process of communication with the public, providing them with easy to obtain information about their systems and their capital programs, can create an attitude of trust that leads to public buy-in. In Washington, D.C. and Hong Kong, systems have been successful in accomplishing this.

A strong central government structure that gives its leader a strong say and even control over the choices made, can be an effective way make choices. However, this can be counterproductive for transit should the leader be less supportive of transit, as is often the case. Similarly, if the transit agency is beholden for its funding to a higher level of government, it can be hampered in making the most effective capital investment choices if that level of government is not supportive of transit.

Operating and investing in a transit system is a very complex undertaking. Perhaps the most efficient way to convey current and, hopefully, best practices is to convene transit agencies in an information sharing and learning environment targeted to this topic. The Transit Leadership Symposium has been dedicated that goal.

Appendix A: WMATA Theoretical Score of Project – Track Replacement

1. Build and Maintain a Premier Safety Culture and System – Weight = 4

Fix and Maintain the System – 5
Create a Shared Climate of Safety – 2
Expect the Unexpected – 1
Prepare for Extreme Weather – 1
Score for this goal 1: 4 x (5+2+1+1) = 36

2. Meet or Exceed Expectations by Consistently Delivering Quality Service – Weight = 2

Become a Self Service System – 1
Focus on the Customer – 1
Fix It First and Fast – 3
Be On Time – 3
Make it Easy to Plan, Pay and Ride – 1
Score for goal 2: 2 x (1+1+3+3+1) = 18

3. Improve Regional Mobility and Connect Communities – Weight = 1

Be the Region's Transit Leader – 1
Maximize What We Have – 2
Enhance Access – 1
Expand for the Future – 1
Support the Region's Economic Competitiveness – 1
Score for goal 3: 1 x (1+2+1+1+1) = 6

4. Ensure Financial Stability and Invest in our People and Assets – Weight = 2

Add New Sources of Predictable Funding – 1
Increase Efficiency and Lower Costs – 2
Be Green – 1
Recruit and Keep the Best – 10
Score for goal 4: 2 x (1+2+1+1) = 10

Total Score for Track Replacement = (36+18+6+10)/9 = 70/9 = 7.67