

Value Capture Opportunities for Urban Public Transport Finance

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A good public transport system is often one of the defining features of a city, attracting residents, businesses and tourists. However, even in the case of the world's great public transport systems, fares do not fully cover costs. The ratio of farebox revenue to costs for many of the most famous public transport systems is significantly less than one (see Table 1). Substantial government subsidies are required to build, maintain, and operate most public transport systems. One of the challenges faced by cities is where this money should come from.

An often discussed set of options to solve this financing challenge comes under the umbrella title “value capture.” Successful public transport systems generate substantial economic value for cities because they improve accessibility in station areas. They increase the value of land in the immediate areas around stations, and they support the “agglomeration economies” that make cities the vibrant engines of our global economy. Value capture is the concept that government may be able to capture part of the economic value generated by public transport systems, and use these funds to help finance the system. The topic of using value capture financing mechanisms to support public investments in infrastructure has received significant academic and practitioner attention in the past five years.

Table 1: Examples Illustrating Range of Farebox Recovery Ratios of Operating Costs

City	Public Transport System	Year	Ratio of Fares Collected to Operating Expenses
Hong Kong	Mass Transit Railway Corporation	2012	1.8
London	Underground	2012	0.9
Washington, D.C.	Metro	2013	0.7
Montreal	Subway	2013	0.7
Paris	Metro	2012	0.6
New York	New York City Transit (subway and city bus)	2012	0.4
San Francisco		2012	0.3

This paper presents a comprehensive discussion of the value capture mechanisms that cities can and do use to help finance their public transport systems. It highlights the most important findings from the literature and adds new insights gained through case studies of public transit finance in six European and American cities. The objective is to inform a lively and productive

dialogue on non-fare sources of public transport finance, and ultimately to find the best ways to finance the maintenance and extension of transit service in cities around the world.

The original meaning of “value capture” refers specifically to land value capture. The definition we adopt in this paper is broader, including strategies to capture any sort of location-based value. These include property taxation strategies such as Tax Increment Financing, special assessment districts, and “betterment” taxes; joint development strategies and sale or lease of land, development rights, or air rights; transit-focused development fees (often with associated density bonuses); and even other location-based taxes that fund transit, such as Paris’ transport tax on income. Appendix A provides brief definitions of each value capture mechanism discussed. It is worth noting, however, that even this is not an exhaustive list; capturing the value of location and access is a task to be approached with creativity.

Case Study Approach

In an attempt to shed light on some of the remaining questions about using value capture to finance public transport systems, interviews were conducted with high-level transit staff in six cities in Europe and North America: New York, London, Paris, Washington, D.C., Montreal and San Francisco.¹ In these interviews, we discussed current major value capture initiatives as well as the past experiences and future plans of the agencies implementing value capture strategies.

There is a long story behind the decision to utilize location value capture funding mechanisms in each of these cities, and from these stories emerge key themes that are relevant for understanding the process by which a city/transit agency decides to rely on value capture to raise a significant amount of revenue. Appendix B provides summaries of these stories.

Table 2 provides examples of specific large transit infrastructure projects in the case study cities that have been or are planned to be financed partly using location value capture strategies. Four of the case study cities have paid or are currently paying for significant new infrastructure through value capture, and Montreal is likely to begin raising significant funds through value capture in the near future. San Francisco raises more than 25 percent of its total budget from location-based value capture mechanisms, but is not included in the table because the money is not dedicated to a specific large project. Using these financing mechanisms for large projects is a relatively new phenomenon in all of our case study cities.

Table 2: Funds Raised for Selected Large Value Capture Projects in Case Study Cities

City	Value Capture Financed Project	Funds Raised or Projected	Percent of Project Cost or Budget
London	Crossrail	£4.1 billion (Business Rate Supplement) £0.6 billion* (Community Infrastructure Levy)	32%
Paris	Grand Paris Express	€21.8 billion*	80%
Washington, D.C.	New York Avenue Metro Station (2001)	\$25 million	28%
Washington, D.C.	Dulles Metrorail Silver Line Expansion	\$400 million (Tyson's Corner SAD) \$330 million (Reston/Herndon SAD)	14%
New York	7 Line Extension	\$2.1 billion (Hudson Yards TIF-like)	88%

* There is some indication that actual funding may fall short of these projected levels.

How Much Value Does Transit Create?

A clear prerequisite to implementing a value capture strategy to raise funds is that there is actually value to be captured. Theory suggests that because public transport increases accessibility, willingness to pay for nearby properties should increase as well. The question is by how much, and how does this created value vary by property type, public transport characteristics, and local land use characteristics? Broadly, the increase in value attributable to new transportation infrastructure should be a function of the type of service (bus, rail, highway), the distance of the property to the new infrastructure, the use of the property, the quality of the service, and transportation alternatives. This section presents some existing estimates of the price premium attributable to urban transit systems in developed and developing city contexts.

The Royal Institute of Chartered Surveyors provides an exhaustive report on the impact of rail-based public transport on land values in the United States and Europe, reviewing approximately 150 studies. They found that rail transit generally has a positive effect on both commercial and residential property values. Importantly, they also found that this impact is influenced by both the public transport mode and the presence of complementary policies to encourage changes in land use or discourage automobile use. Since the RICS report, some important studies have been done in North America and Europe. One study provides a meta-analysis of the impact of public transport stations on residential and commercial property values based on 57 previous estimation results. They find that commercial property prices are 16.4 percent higher and residential properties are 4.2 percent higher within one-quarter mile of stations, and that the effect is largest for commuter rail.

¹ Interviews were not conducted in key cities in Asia. This choice was made for two main reasons. First, the use of value capture mechanisms to fund transit in Asian cities is more thoroughly studied and documented than its use in US and European cities. Second, there have been recent high profile examples of value capture implementation in many of the case study cities.

² Another study examined the effect of two new rail lines in London, finding that prices of residential properties within two kilometers of stations grew 9.3 percent more than house prices elsewhere in London.³ A 2010 RPA report found that even an improvement in service at existing stations can have a significant effect on property values.

One summary of the literature on property value impacts of public transport in mostly East Asian developing cities points out that this literature focuses on residential property values.⁴ There is a clear positive impact of public transport access on property values from rail, BRT, and even conventional bus. Overall, a 10 percent increase in distance from a rail station reduces residential property values by roughly one percent, although this varies by study and methodology. Studies that try to parse the impact of public transport on land values in various ways show that the impacts vary depending on where in the city the land in question is located, as well as on whether there is supportive land use (e.g., transit-oriented development) in the station areas.

Comparison of Value Capture Mechanisms

Once it is determined that transit generates location-based value in a city, financing that transit system using value capture becomes an option to consider. Three main questions arise:

- When is it appropriate to use value capture mechanisms to fund public transport?
- How does value capture compare with other forms of non-farebox funding sources for transit?
- How do value capture mechanisms compare with each other?
- These questions are addressed in the existing literature. This section summarizes the main findings.

When value capture is appropriate

When identifying the most efficient set of financing sources for transportation, one approach is that costs paid should be proportional to benefits received.⁵ There are three sets of beneficiaries of urban transport infrastructure: (1) the general public (because the urban economy is enabled by the infrastructure), (2) property and business owners in the vicinity of infrastructure (because the access afforded by that infrastructure increases the value of their holdings), and (3) direct users of the infrastructure. The first and last of these beneficiaries contribute to public transport finance routinely through general taxes and fares, respectively.

It is the second group of beneficiaries that experiences sustained value from upkeep of existing infrastructure and gains from the construction of new infrastructure. This is value over and above that which they derive either as part of the general public or as riders. However, these beneficiaries are not always asked to help pay for the cost of the infrastructure. Value capture mechanisms allow for public transport systems to be paid for in part by these beneficiaries. There is “consensus among scholars that public investment costs should be at least partially covered by the [private] financial benefits that these investments generate.”⁶ In addition, “As long as the spatial distribution of project benefits can be internalized within a well-defined ‘benefit zone,’ it is economically efficient to finance infrastructure projects by tapping the increments in land values resulting from them.”⁷

It is worth noting that it is not actually desirable to capture all of the location-based added value of transit, for two related reasons. First, it’s in the transit agency’s and the city’s interest to encourage people to live close to transit stations. Thus, leaving some windfall value on the table for developers to cash in on is a good way to incentivize the construction of higher density development near transit. Second, in trying to capture all the value, the public sector may overreach and actually depress development near transit. This second point is an important one that will be made clearer in the Grand Paris Express case documented later.

Value capture revenue versus general public revenue

One large difference between location-based value capture financing mechanisms and most general public revenue-based transit funding is in the potential for revenue stream volatility. Value capture mechanisms that are tied to specific real estate markets can fluctuate with the rhythms of those markets. Mechanisms that are tied to new development will yield revenue streams that rise and fall with booms in construction. Similarly, value capture mechanisms that are tied to payroll are subject to business cycle fluctuations. Sales tax receipts and public sector budgets will also rise and fall with the cycles of the overall economy, but these fluctuations are often not as large as those in individual economic sectors.⁸

It is possible to compensate for the volatility of a revenue stream with smart financial management practices, such as putting money in a “rainy day” fund in the high years to compensate for the revenue shortfall in the low years. However, most public agencies do not have experience with managing such volatile revenue streams, and it’s rarely clear whether a given situation is part of a cycle or part of a trend. An interviewee at Transport for London said, “When one of the developers at one of our stations went insolvent, it felt like quite a grim day.” It may be both politically and practically difficult for historically cash-poor institutions to avoid overspending in the high years, making heavy reliance on volatile revenue streams imprudent.

² Debrezion et al.

³ Gibbons and Machin

⁴ Salon and Shewmake

⁵ Iacono et al.

⁶ Ingram and Hong

⁷ Peterson

⁸ Cornia and Nelson

Another difference of note is the equity implications of the financing mechanisms. Of interest is equity across income levels, across space, and across modes of travel in paying for transport service within a metropolitan area. Equity across income levels is mechanism-specific, both for location value capture mechanisms and general revenue financing. Income and property taxes are generally regarded as less regressive than sales taxes, but the details of the taxation instrument do matter. In terms of spatial equity, location value capture mechanisms fare much better than general revenue financing because the local group that is benefiting most from the infrastructure is the group that pays.

It is worth noting that it also matters whether the property is commercial or residential. Residential property can go up in value faster than the incomes of the owners. On the other hand, commercial rents are more closely aligned with property values. This is likely the reason that many value capture mechanisms target commercial rather than residential properties.

A popular non-fare transit financing strategy is to have car users pay via charges such as vehicle license fees, tolls and parking fees. This raises the issue of equity across modes of travel. The two basic arguments for car users to pay for transit are that car use leads to substantial negative externalities in cities and transit use does not (so car users should subsidize alternative modes), and that car users directly benefit from improvements to transit because the roads are less congested. While these basic arguments are theoretically sound from an efficiency perspective, the question remains of the fairness of transfer from car users to transit.

Comparison among value capture mechanisms

There are clear dimensions along which value capture strategies can be compared.⁹ These dimensions include who is asked to contribute (i.e., property owners, businesses, developers), the timing of the contribution (i.e., one-time, ongoing), and the spatial extent of the benefit zone within which value capture contributions are collected (i.e., immediate vicinity of station, zones within city, whole metro area). With this framework as background, Table 4 provides an overall look at which value capture mechanisms have been used to raise revenue for transit in each of the case study cities. An annotated version of this table is available in Appendix C, providing details of the implementation schemes, funds raised and what they are used for.

Table 3: Key Dimensions of Value Capture Mechanisms

Value Capture Mechanism	Contributor	Timing of Contribution	Spatial Extent of Benefit Zone*
Land Value/Property Tax	Property owners	Ongoing	Metropolitan Area
Tax Increment Financing	Property owners	Ongoing	Neighborhood of Improvement
Special Assessment District	Property owners, Businesses	Ongoing	Neighborhood of Improvement
Transit-Focused Payroll Tax	Businesses	Ongoing	Metropolitan Area
Transit-Focused Real Estate Transaction Tax	Property owners	One-time	Metropolitan Area
Transit-Focused Development Fee	Developers	One-time	Metropolitan Area
Development Rights/ Air Rights	Developers	One-time	Specific parcels at or near station
Joint Development	Developers	One-time	Specific parcels at or near station

* The spatial extent of the benefit zone for each mechanism is more fluid than the other characteristics, and can be specified in a variety of ways for each of them. This table reports the most common spatial extent used.

Table 4: Value Capture Mechanisms in Case Study Cities

	London	Paris	Washington, D.C.	New York	Montreal	San Francisco
Land value tax/Location benefit levy	X					
Tax Increment Financing (TIF)	X			X		
Joint development	X	X	X	X		X
Sale or lease of land				X		X
Sale or lease of development rights or air rights	X			X		X
Advertising and lease of commercial space in stations	X	X	X	X	X	X
Transit company business diversification		X			X	X
Payroll-based tax		X		X		
Transit-focused development fees	X	X				X
Transit-focused property transaction taxes				X		
Special Assessment Districts (SAD)			X			

There are two points of note. First, all of the cities are implementing at least two mechanisms on this list, and a number of the cities are implementing most of them. Second, in all of these cities except for Montreal, revenues that capture the value of location are significant. Transport for London estimated that value capture revenues cover approximately 10 percent of total system costs. Payroll taxes in Paris and New York cover 40 percent of operating costs and 10 percent of system costs, respectively, and each of these cities has other important sources of location-based revenue as well. The San Francisco Municipal Transportation Agency raises 25 percent of their transit operating costs from parking fees. In coordination with local business interests, the Washington Metropolitan Area Transit Authority has raised a substantial portion of the capital costs for two infrastructure projects using special assessment districts (see also Table 2).

⁹ Iacono et al.

The remainder of this section provides some context for thinking about value capture mechanisms from both an efficiency standpoint and an equity standpoint.

Efficiency

An efficient value capture strategy captures the increment in the value of locations that is associated with a public investment. The most economically efficient value capture mechanism, then, would be a pure location value tax, such as a land value tax.¹⁰ There are at least three challenges in implementing such a tax, however. First, the pure value of location cannot be easily separated from the value that is created by the efforts of the developer or business or property owner. Second, the value of location is related to many aspects of that location. It is hard to disentangle the value added by one piece of infrastructure, such as a transit line, from the value of other intrinsic elements of the location. Finally, it is not clear how large the circle of location value influence is for a given piece of infrastructure.

To the extent that a value capture mechanism uses privately created value as its basis, it actually puts negative pressure on local economic growth. Nearly all of the value capture mechanisms in use have this drawback. Development fees directly penalize construction. Payroll taxes directly penalize business activity. Property value-based mechanisms (i.e., property taxes, TIF, SAD) can have a negative effect on development as well, since the larger the improvement on a piece of land, the higher the property tax will be. In the case of the Grand Paris Express project – slated to be mainly financed through a high tax on new office development – it has been suggested that the tax is so high in some areas that it will actually forestall office development.¹¹

In cases where the taxes are levied chiefly on existing buildings that are expected to become substantially more productive as a result of new transit access, this efficiency issue is less important. London's Business Rate Supplement currently being collected to fund a large portion of the Crossrail project is a good example of such a tax. However, the BRS value capture mechanism has a different efficiency drawback, which is that its tax rate is not differentiated according to location.¹² One possible way to improve the efficiency of the mechanism is that the BRS be restructured such that those areas of the city that gain most from the Crossrail also pay the most.

Equity

Equity issues loom large when considering large-scale financing of public infrastructure via value capture. Who is the group that is actually providing the value capture funds? Is this the same group that will experience windfall benefits from the new infrastructure? Are these location benefits liquid, or are the benefits tied up in real property value increases? What is the group's ability to pay? Different value capture mechanisms lead to different answers.

Increasing residential property taxes can be challenging for less well-off households because the increase in their property value is not liquid. This question of ability to pay can arise even if the property tax rate is unchanged (such as in a TIF zone) but property values rise due to a major infrastructure improvement.

Tax Increment Financing is a mechanism that assigns the property taxes on the increment in value above a certain baseline level to pay for local infrastructure within a specified benefit zone. TIF is a good deal for people in the benefit zone because they get local infrastructure without paying higher tax rates, and the extra taxes that they pay due to higher property values go directly into making their neighborhood a better place to live. If all of the above-baseline value can be directly tied to the infrastructure improvement, then TIF mechanisms are a win-win proposition. However, to the extent that increased values in the benefit zone are due to overall economic trends, building owners in the zone contribute less to the overall city budget than they would otherwise. This creates an equity imbalance between those in the zone and those outside of it. A TIF-like mechanism was recently implemented in New York to help fund the Hudson Yards redevelopment and the Metropolitan Transportation Association's 7 Line Extension. This is an extreme case where the baseline value was set at zero, meaning that all of the property tax proceeds from the area go to pay for local infrastructure, and the people who live there (or who will live there in the new developments) do not pay into the general city coffers.

Special Assessment Districts are geographically equitable financing mechanisms as long as the taxed benefit zone coincides with the actual benefit zone. Often, however, most or all residential properties are exempt, which creates problems with efficiency and equity. This difference in treatment between residential and commercial properties will be discussed more below.

Development fees generally satisfy both geographic equity and income equity concerns, but their revenue-raising potential is limited in that they are paid only by new development. They also raise another equity issue: existing residents do not contribute.

Site-specific mechanisms

Joint development projects and strategies such as sale or lease of development or air rights do not pose significant efficiency or equity concerns. Since they are individualized contracts between a public agency and the private sector for specific projects, the result should be reasonably efficient and equitable for both sides. However, these strategies can be somewhat risky for the public agency if that agency does not have the internal capacity to properly negotiate a good contract. Some observers have criticized the development rights arrangements recently negotiated by New York's Metropolitan Transportation Authority for its Atlantic Yards and Hudson Yards sites as being too favorable to developers¹³.

In the U.S. and Europe, most site-specific development projects are relatively small in terms of the potential to raise funds when compared with benefit zone-wide, tax-based value capture mechanisms. However, it can be argued that both Hong Kong

¹⁰ Note that a land value tax is a tax on only the value of the land, not including the value of any improvements that have been made on that land. This is not the same as a property tax.

¹¹ Jérôme

¹² Roukouni and Medda

¹³ Jaffe

and Tokyo have financed a large portion of the cost of their transit systems using these value capture mechanisms. Specifically, Hong Kong has primarily used land sales and leases and Tokyo has used privatization of transport service and joint development.

Figure 1: Hong Kong's International Finance Center mall and cinema with an MTR station integrated into the building.



Source: commons.wikimedia.org.

Hong Kong's Mass Transit Railway Corporation model is known as "Rail + Property" whereby the corporation concurrently develops property and the MTR system. To enable this, the Hong Kong government provides a large indirect subsidy to the MTRC in the form of land provision at pre-MTR rates. The corporation then sells or leases those lands at post-MTR rates, using the difference in value to pay for the transit infrastructure.¹⁴ While this model of value capture is clearly successful, it is perhaps impossible to implement where the city or transit agency cannot assemble land at favorable prices near a planned rail line.

In Tokyo, numerous private corporations claim rail as their "core" business, but most of these in fact earn more of their profits from associated real estate ventures in and around their rail stations. Some of these corporations have branched out even further from rail, and also operate major department stores, construction businesses, education facilities, and other services.¹⁵ This is called a "rail integrated community" model of transit finance.¹⁶

Adoption and Implementation of Value Capture Mechanisms

This paper has established that there is often location-based value created when transit infrastructure is built or service is improved, and has compared non-fare transit financing mechanisms on the basis of economic efficiency and equity. The important question remaining is about adoption and implementation of value capture mechanisms. What are the factors that provide opportunities and impetus for the adoption of value capture mechanisms to fund transit? What are the barriers? Which political and institutional considerations affect how value capture is implemented? Four factors that impact the implementation and adoption of value capture to fund transit are highlighted here.

Institutions

Where value capture is being implemented on a large scale to finance transit, basic institutional arrangements have been critical. Notably, among our six case study cities, London and Paris have created new governmental bodies that have enabled value capture implementation, Montreal has formally requested that the Quebec provincial government consider a similar move, and the San Francisco Municipal Transportation Agency made important changes to its charter in 2007 that enable certain value capture mechanisms. The governmental bodies created in these cities have authority over region-wide transport planning and finance. As such, they are able to work with the relevant provincial (in Canada), national (in France and the U.K.), and city (in San Francisco) governments to develop taxation schemes to help fund transit. In London and San Francisco, the transit agencies also govern the roads and manage car user fees in the region. This makes cross-mode transportation subsidies relatively seamless, allowing transit to capture part of the location value of central destinations by charging private vehicles for driving and parking there.

In contrast, the transit agency in Washington, D.C. is institutionally stuck in a place where large-scale value capture financing is "a very attractive yet very impossible way to generate funding" (WMATA interviewee, February 2014). The WMATA is funded directly by multiple local and state governments in their region, and there is no realistic way to coordinate a taxation scheme across that many different governments. Where the agency does have significant value capture financing of infrastructure, it is Special Assessment District-based and entirely the initiative of the local community to tax themselves (see Table 2).

¹⁴ Cervero and Murakami

¹⁵ Tang et al.

¹⁶ Calimente documents the successful case of the Tokyu Corporation in his recent article on the "rail integrated community" model.

Transit finance crisis

For transit agencies in the U.S. and Europe, serious consideration of location value capture financing strategies is usually precipitated by a financial crisis. Crises in financing for operation and maintenance of existing infrastructure or a need for additional infrastructure without a clear mechanism to pay for it forces cities and their transit agencies to think out-of-the-farebox about financing solutions. In three out of six case study cities, such a crisis was at least a part of the motivation for implementing value capture.

New York's MTA has repeatedly faced severe operations and maintenance finance crises and has not been politically able to increase fares sufficiently to solve them. In part to solve one of the most recent crises, New York State authorized the Payroll Mobility Tax to be collected from all eligible employers within the New York State portion of the MTA region.

Figure 2: London's Crossrail project will provide high frequency and high capacity rail service for London and the South East.



Source: www.bbc.co.uk; www.crossrail.co.uk.

In London, crowding has increased on the transit system due to sustained economic and population growth, implementation of a congestion charge for cars, and other programs to encourage transit ridership. Together with the institutional changes discussed above, this has pushed and enabled the city to develop and implement a set of value capture mechanisms to raise a large amount of funding for the new Crossrail infrastructure.

In Montreal, the provincial government has changed its policy, and now requires a certain percentage of local match funding before it will commit funds to build new railways.¹⁷ This means that if Montreal is going to build additional rail lines, these local match funds are likely to come from the jurisdictions that will benefit from the infrastructure. The city's transit agency is currently in negotiations with the provincial government regarding what institutional framework should be used to collect the needed funding so that projects can move forward.

Washington, D.C.'s WMATA is in the unusual position of having to negotiate its budget each year with local and state governments in the region. This process has its own challenges – it is reportedly an “extensive and excruciating negotiation with all

the jurisdictions” – but if the agency had a major financing crisis, then its member governments would be responsible to raise funds to solve it.

Interestingly, the narratives from our case studies suggest that, at least within these cities, value capture mechanisms were turned to as a “last resort” of sorts for transit finance, when no other sources of funding were available for critical new infrastructure and/or for basic operations. This is not the case where value capture has been implemented on a much larger scale, such as in Hong Kong and Tokyo. In fact, these systems were built on a platform of value capture, integrating land development with transit development virtually from the start.¹⁸

Transit agency mission

Transit agency institutional culture and mission can also be important. The New York MTA and Washington, D.C. WMATA have clear transit-provision missions, while other transit agencies also have road transport in their purview. Still other transit agencies may actually be partly or wholly privatized with much more diversified business models, as is the case in both Tokyo and Hong Kong.

These differences in mission translate into differences in the ways that agencies view opportunities. For instance, in response to a question about commercial leasing of space in stations, a WMATA interviewee explained, “Our spaces are used to move passengers, and we don't have a lot of excess [space].” In contrast, Montreal's Agence métropolitaine de transport shared the viewpoint that all transit agencies in that city are working to increase their non-fare revenue sources, and they aim to lease commercial space in their stations wherever it will be profitable to do so. Both the San Francisco MTA and Transport for London are actively working to increase value capture revenue-raising opportunities wherever they are politically and practically feasible.

Public acceptance of new taxes

Finally, for value capture to be successful, the public must either accept new taxes or approve the reallocation of existing taxes to fund transit. The first question that arises is whether the public is willing to accept any new taxes. In places where the status quo has been for the state, provincial, or national government to pick up the tab, new taxes are not easily accepted. An interviewee from WMATA spelled this out clearly, saying, “This is Washington. Everybody likes to point the finger at Capitol Hill and beg for money. I think that that ends up being the default position.”

Another important question that arises is who is paying these taxes – households or businesses? Almost exclusively in the cities studied for this paper, businesses are providing the lion's share of the location value capture revenues. Despite the fact that in many cities, most of the benefit value to be captured accrues to residential properties, none of the cities had existing programs or future plans to directly add taxes to existing residential properties.

¹⁷ Previously, the provincial government paid for 100% of new railway capital costs.

¹⁸ Cervero and Murakami, Calimente

The reason for this strong trend is a combination of the equity and efficiency concerns described earlier in this paper, as well as simple politics. An interviewee from Transport for London said, “An Englishman’s home is his castle,” explaining that residential properties in the U.K. are given favorable terms across many sorts of taxes. It is a political nonstarter to suggest increasing the property tax on residences. Certainly cities and transit agencies would like to tax residential properties that receive location benefits from proximity to transit. In San Francisco, there is a new tax law being considered that would extend the current transit-focused development fee for commercial properties to residential development. Despite the fact that the proposal is only to tax new development rather than existing residential properties, the new tax is expected to be controversial.

In contrast, there can be surprisingly little controversy over new taxes that target businesses. For instance, the Business Rate Supplement in London is raising a large sum to pay for the Crossrail project, and there has been “remarkably little fuss” about it. The reason is likely two-fold. First, most of the valuable businesses in London that are close to the route expect the value of their buildings to go up by 10-15 percent as a direct result of Crossrail. The BRS is lower than that, so they can easily see that they will profit overall. Second, the Crossrail project has a long history. It had been considered for about 20 years as a strategy to relieve congestion in the existing transport system in central London. An interviewee from London explained that when the time came to actually implement the BRS and the project, “the general feeling from the population was kind of ‘get on with it.’”

Conclusion

This paper has synthesized recent literature with additional lessons learned from the value capture experience of six public transport systems. There has been a substantial amount of thinking and research done in this area over the past decade. Consensus has been reached regarding the concept of using value capture for a portion of public transit finance, and important efficiency and equity issues have been explored. What questions remain?

Perhaps the biggest remaining question is a practical one: How can transit agencies transition from being reliant only on fares and general public revenue to a more complete financing package that incorporates appropriate use of mechanisms to capture the value that transit systems add to locations? Through the case studies conducted for this paper, I have begun to explore this question. The answer will be unique for each city and each transit agency, but it is clear that:

- Institutions and their cultures and mission matter.
- Financial or operational crises provide motivation for action.
- The willingness of the public to accept new or existing taxes for transit is essential to the success of any value capture scheme.

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Appendix A: Value Capture Mechanism Definitions

Land value tax/Location benefit levy: Tax on the value of land in the vicinity of a public transport amenity. Note that this mechanism is a tax on the land only, and that this is distinct from a conventional property tax.

Tax Increment Financing: This mechanism allocates any increase in total property tax revenues toward public investment within the designated TIF district.

Joint development: Joint development is a partnership between the private sector and the local government or public transport agency to build a real estate project on land controlled by the public sector. The local government or public transport agency captures value by requiring a private developer partner to build a portion of the station amenity as part of their real estate project, thereby reducing their capital costs.

Sale or lease of land: The local government or public transport agency acquires (re)developable land in the vicinity of the public transport facility at the going price before the public transport system is built. After the system is in place, the owner can sell or lease the now higher-value land on the open market, capturing the added value in the transaction.

Sale or lease of development rights or air rights: The local government or public transport agency acquires land in and adjacent to the public transport facility at the going price before ground is broken to build the public transport system. After the system is built (or concurrently), the owner can then enter into long-term leases with developers for ground, air, or subsurface development rights. The added value from the public transport system is capitalized into the lease price.

Leasing of commercial space in and around stations: The public transport agency or local government develops and retains ownership of the commercial space in and around stations, and leases it out to businesses at market prices.

Transit company business diversification: The public transport company diversifies its business to include real estate and other station-area commercial businesses.

Income or payroll-based tax: Income earners or employers in the region served by the transit system pay an extra increment of income or payroll tax that goes to the public transport agency.

Transit-focused development fees: Developers working in the vicinity of a public transport system pay extra fees for the privilege of building new real estate projects.

Special Assessment Districts: Districts benefiting from a public transport improvement may choose to self-impose an additional tax to help finance the improvement. These special assessments are generally approved through some form of vote by the group that will be paying the tax. This group could be local landowners, local residents, or local businesses. The taxes are usually meant to finance a portion of the local infrastructure investment rather than to subsidize the system operating costs.

Appendix B: Case Study Summaries

This appendix provides short narratives that summarize the story of value capture mechanism adoption to fund public transit in each case study city.

Washington, D.C.

The Washington Metropolitan Area Transit Authority has an active joint development program, and has been fortunate to be the recipient of Special Assessment District financing from three separate SADs that are helping to finance two major projects. Despite this relatively successful track record of using value capture mechanisms to fund system expansion, WMATA is not optimistic about a large role for value capture to finance the system going forward because of the institutional structure of the region and therefore the agency. WMATA was jointly created by the District of Columbia, the State of Maryland and the Commonwealth of Virginia, and receives subsidies from each of these governments for both operations and capital expenses. The fact that the transit agency serves communities in two states plus the District of Columbia makes it virtually impossible for the agency to implement a large-scale, coordinated, system-wide value capture financing program. The legal frameworks for taxation are substantially different in each government.

Montreal

Although Montreal has not yet financed major infrastructure using value capture mechanisms, it is expected that significant value capture-funded projects may soon begin. Historically, the Quebec provincial government has financed 100 percent of rail expansions but only 75 percent of the cost of most other local infrastructure projects. This system clearly incentivizes local jurisdictions to request rail extensions over other transport investments, and the provincial government has indicated that they are planning to change the funding formula. Rail is expensive, however, so local jurisdictions will need a new way to raise revenue to pay for their share of these projects. The region's transit agency – Agence métropolitaine de transport – has begun to seriously consider value capture as a way forward. First, AMT sponsored a study to verify that proximity to commuter rail in the

Montreal region adds value to properties; the particular rail line studied generates an additional \$11 million in annual property tax revenue for local jurisdictions.¹⁹ Then, in June 2013, AMT submitted a formal request to the Quebec provincial government to suggest the use of value capture to fund subway and commuter rail expansion in the region. The Quebec government is expected to respond positively, at which point AMT will work with local governments in the Montreal region to develop specific value capture-based strategies to help finance both commuter rail and subway extensions.

London

Transport for London is a regional public service provider created in 2000 with a publicly elected leader – the Mayor of London. TfL has authority over the region's rail-based public transport infrastructure as well as its streets (including implementing the city's congestion charge), bicycle routes, and pedestrian infrastructure. The many new transit initiatives in London have led the city to look to new forms of financing, including value capture strategies. In addition, rising commercial values in London have led TfL to reassess the commercial possibilities within their own real estate holdings. The largest location value capture mechanism currently being implemented in London is a supplement to an existing property tax on commercial buildings, called the Business Rates Supplement. Revenue raised through the BRS will be used to finance a portion of the construction of the new 21-km Crossrail line that will soon traverse the region. In addition to the BRS, the Crossrail is partially funded through a tax on new development that is spatially graduated according to the property's proximity to the new line. Due to a lull in construction, however, this tax has not brought in as much money as expected. Looking forward, TfL is working to convince the national government that all of the business rates paid in London should be devolved to the regional and local governments that provide services to the Greater London area. Because London's growth has been strong recently, someone is going to have to pay for it, and it is logical to ask London funding sources to pay rather than funneling money from outside the city. One of our TfL interviewees remarked, "I think we've got half a chance."

New York

The New York Metropolitan Transportation Authority is the owner and operator of two major commuter rail systems (the Long Island Railroad and the Metro North Railroad), the New York subway system, the Staten Island Railroad, and New York City buses. The agency's use of value capture mechanisms to fund its system has been limited even though New York's real estate market is responsive to proximity to transit, and the agency has had financial difficulties. One important explanation is related to the agency's mission and culture as a transit service provider rather than an entrepreneurial business, and related lack of capacity in the area of real estate. That said, a portion of the NYMTA operating subsidy does come from location-based value

capture mechanisms, and the agency has recently negotiated real estate deals for two of its largest holdings (Atlantic Yards and Hudson Yards). The portion of the operating subsidy raised via location value capture is from the New York State-implemented tax on the payrolls of all businesses above a certain size within the NYMTA service area – the Payroll Mobility Tax – and a tax on real estate transactions called the Mortgage Transfer Tax. The latter of these is well established, but the PMT was implemented in its current form starting in 2010. This makes the tax more politically controversial and its future therefore uncertain.

The recently-negotiated Hudson Yards real estate deal is an interesting value capture case. This railyard is located on the west side of downtown Manhattan in what would otherwise be prime real estate. The NYMTA did not aggressively pursue using its valuable holding to raise revenue as some observers argued that it should, but the City of New York recognized the value and pushed the deal forward. In the end, a TIF-like financing scheme was implemented that pays for the construction of the 7 Line Extension to serve the new development, and a large platform on top of the railyard (which will continue operations underground) that will support residential and commercial towers. It is not yet clear whether the deal will be a net gain or loss for the MTA.

San Francisco

The San Francisco Municipal Transportation Agency has authority over the majority of the streets, sidewalks, and rails in the city of San Francisco. It was established by a voter proposition in 1999 as a merger of the Municipal Railway (Muni) and the city's Department of Parking and Traffic. SFMTA now oversees the Muni, parking and traffic, bicycling, walking and taxis. The advantage of having a city's streets, bicycle infrastructure, sidewalks and most of its rails managed by the same agency is clear in terms of coordination opportunities, but for historical reasons, many cities are not organized this way. As an SFMTA interviewee said, "We're an experiment. Can you manage the right of way in a congested city?" Part of managing this right of way has been considering and implementing location value capture finance mechanisms to help pay for Muni. Thus far, the largest example is the subsidy provided to Muni out of parking revenues, providing 25 percent of Muni's operating budget. In addition, there is a serious proposal to amend the city's longstanding Transit Impact Development Fee with a more holistic Transportation Sustainability Fee that would raise substantially more revenue because both residential and commercial development would be subject to the fee. It is worth noting here that San Francisco is a much smaller city than the others considered here, with fewer than one million residents.

Paris

Three main entities in Paris play important roles in the finance, operations, and expansion of the city's public transit system. The Syndicat des transports d'Île-de-France, or Paris Transport Authority, provides the budgets for operation, maintenance, and modernization. The Régie Autonome des Transports Parisiens

¹⁹ Dubé et al. 2013

operates much of the actual system, including the Paris Metro system, trams, buses, and two of the regional rail lines that serve the city. The Société du Grand Paris is a regional governmental body created by the French government in 2010 with the goal to build a 200 kilometer extension to the rail system in the Paris region – the Grand Paris Express.

Two main location value capture mechanisms are used to finance public transport in the Paris region. The first is a longstanding payroll tax that was implemented in the 1970s. This tax – the *versement transport* – varies depending on which part of the region the business is located in. The most central areas pay a 2.6 percent payroll tax, less central areas pay 1.7 percent, and areas at the edge of the region pay 1.4 percent. These taxes go to STIF, which then distributes them to RATP and to other public transport operators in the region. The *versement transport* provides 40 percent of the STIF budget. The second major use of value capture in the Paris region is a newly-implemented development tax on office space that is slated to pay for the construction of the new Grand Paris Express. This tax is projected to raise €350 million per year starting in 2014, but there is considerable ongoing discussion about whether this value capture strategy is a good idea. Specifically, the concern is that the tax is high enough that it might actually depress the regional economy through reduced new development, and not raise sufficient funds for the rail extension.

Appendix C: Table 4 Notes

	London	Paris	Washington, D.C.	New York	Montreal	San Francisco
Land value tax/Location benefit levy	Xa					
Tax Increment Financing (TIF)	Xb			Xc		
Joint development	Xd	Xd	Xd	Xd		Xd
Sale or lease of land				Xe		X
Sale or lease of development rights or air rights	Xf			Xf		Xf
Advertising and lease of commercial space in stations	Xg	Xg	Xg	Xg	Xg	Xg
Transit company business diversification		Xh			Xi	Xj
Payroll-based tax		Xk		Xl		
Transit-focused development fees	Xm	Xn				Xo
Transit-focused property transaction taxes				Xp		
Special assessment districts			Xq			

- a This tax is called the “Business Rate Supplement”, and is collected on all existing commercial buildings that rent for more than £55,000 per year in the Greater London area. The rate of the tax is 2 percent, and it is the largest source of value capture-based revenue to fund the Crossrail project. The BRS is expected to provide £4.1 billion for the project, which is slightly more than 25 percent of the total projected cost of the project.

- b TIF districts in London are called “Enterprise Zones.” As in the U.S., these areas are run-down, but expected to have potential for transformation with the boost of incremental tax revenues to finance local infrastructure.
- c The City of New York is using a TIF-like financing mechanism to develop the Hudson Yards site in lower Manhattan. The difference between this mechanism and a traditional TIF is that all of the property tax proceeds from the Hudson Yards site will fund local infrastructure, rather than only the increment over and above a baseline amount. Much of the money will pay for the 7 Line Extension, which is projected to cost \$2.4 billion (IBO, 2013)
- d Joint development is a widely used tool that allows developers to share in paying for infrastructure investments that will add value to their real estate holdings. These are generally projects that are confined to a single site, building, or transit station.
- e Two large long-term land leases were recently negotiated: Atlantic Yards in Brooklyn and Hudson Yards in downtown Manhattan.
- f Sale or lease of development rights or air rights is a relatively low-yield and location-specific value capture strategy.
- g Virtually all transit agencies take advantage of opportunities to earn advertising revenue through ad placement in stations, on vehicles, and sometimes also on their land (e.g. at Park-and-Ride facilities). Similarly, commercial leasing of space in major stations is done by most agencies, though the level of integration between shopping and transit varies tremendously.
- h The largest transit operator in Paris (RATP) has subsidiary companies that are active both in the transit operation business outside of Paris (in multiple cities around the world), as well as in other industries such as telecom and engineering.
- i Montreal’s largest transit operator (STM) has subsidiary companies active in real estate and the telecom industry.
- j With changes to their charter in 2007, the SFMTA diversified from being chiefly a transit operator to being in charge of all transportation in the city. This has meant that they can set car user fees (mainly parking, both street and in garages), and subsidize across the transport modes. Approximately 25 percent of the transit operating budget now comes from private vehicle parking charges.
- k The payroll-based *versement transport* in the Paris region raised approximately €3.1 billion in 2012, which is nearly 40 percent of the total operating budget for public transit in Paris. This tax has been in place since the 1970s, and is not controversial. It is paid by all employers in the region with 10 or more employees, and the rate of tax ranges from 1.4 percent to 2.6 percent, depending on how centrally-located the business is.
- l The Payroll Mobility Tax in the MTA portion of New York State began collection in 2010 and is controversial. The tax is paid by all employers in the region with more than \$312,500 in payroll expenses per quarter. The tax rate ranges from 0.44 percent to 1.36 percent, depending on the size of the total payroll expenses, where larger firms pay a higher rate. The PMT provides approximately \$1.3 billion per year to the MTA, which is about one-fifth of the total subsidy provided to the agency from all government sources.
- m These fees are called the Community Infrastructure Levy and are collected on most new building permits in the Greater London area. The CIL revenue will finance part of the Crossrail project, but is not as large of a source of funding as the BRS (see note a).
- n There are two kinds of development taxes being collected in the Greater Paris region, both earmarked to finance the Grand Paris Express project. The first is fees collected on new office space. These fees are large, and expected to provide €350 million per year in transit financing. The second is fees collected for new building permits, expected to raise approximately €120 million per year.
- o San Francisco put a transit-focused development tax in place in 1981 with its Transit Impact Development Fee. This development tax exempts residential development, which means that it is not a large source of revenue for the

SFMTA since most recent development in San Francisco has been residential. Currently, there is a serious proposal to replace this tax with a Transportation Sustainability Fee. The main differences between the old and new programs would be that the TSF would include a charge for residential development, and the collected funds would be available for all sustainable transportation projects (i.e. transit, plus also pedestrian and cyclist infrastructure).

- p New York City collects the Mortgage Recording Tax when properties are sold. The collection rate fluctuates with the real estate market, but in 2012, this tax raised slightly less than \$300 million for the transit agency.
- q These taxes have been collected from existing commercial buildings in specific station areas to fund public transit improvements related to those stations. Examples include the New York Avenue Metro Station (2001), now the NoMa-Gallaudet U Metro Station, and the Tysons Corner Metro Station (current project). The mechanisms are championed by local businesses themselves as a way to improve the transit network in their neighborhoods.