Guide to Value Capture Financing for Public Transportation Projects

DETAILS

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Guide to Value Capture Financing for Public Transportation Projects

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Contents

Summary

Transportation infrastructure is a foundation of modern, thriving, and productive economies. Public transit is a key element of transportation infrastructure for many communities and local and regional economies across the United States. Unfortunately, many U.S. transit projects are underfunded, leading to suboptimal service, long-deferred maintenance, and failure to realize desirable projects.

Value capture is the public recovery of a portion of increased property value created as a result of public infrastructure investment. Common value capture mechanisms are:

- Impact fees,
- Joint development,
- Land value taxation,
- Negotiated exactions,
- Parking fees,
- Sale or leasing of air rights,
- Sales tax and special assessment districts,
- Station naming rights, and
- Tax increment financing (TIF).

TCRP Research Report 190: Guide to Value Capture Financing for Public Transportation Projects has been developed to provide transit agencies, local governments, developers, and others with insight regarding value capture as a funding strategy for public transportation projects. The guide highlights requirements necessary for (1) successful value creation through transportation infrastructure investment and (2) capturing a portion of that value through specific value capture mechanisms.

The three primary value capture participants described in this guide are the transit agency, developer(s), and local government:

- **Transit agency:** A public entity, the primary purpose of which is to plan, construct, operate, maintain, and finance public transportation services within a specified service area.
- **Developer(s):** Private or not-for-profit entities that invest in and effect the improvement of real property.
- **Local government:** A public entity that provides municipal goods, services, and infrastructure in the area served by the transit agency.

Conditions Necessary for Value Capture

Value capture concepts addressed in this guide may be relevant to many modes of public transportation, including bus rapid transit, light rail, commuter rail, subway systems, and intercity passenger rail. The economic principles underpinning value creation and value capture in the context of public transit projects may also apply to transportation infrastructure projects in general and even more broadly to other classes of public infrastructure investment.

Transit infrastructure investment often induces value creation in surrounding land and real estate. Capturing a portion of that value to fund transit projects is an increasingly viable and desirable option, subject to a number of enabling conditions:

- Real estate market vitality;
- Accommodative zoning and land use entitlements;
- Statutory authority enabling use of value capture mechanisms;
- Articulation of a compelling business case for value capture to public and private partners and to the financial markets on which they depend;
- Development of project and context-specific financial strategies that are feasible and incentivize and reinforce value creation; and
- Institutional capacity on the part of transit agencies, local governments, developers, and other partners working together to maximize value creation and value capture.

Value capture opportunities and strategies vary significantly due to context. The type and composition of real estate from which transit agencies and local governments may capture value vary from one circumstance and market location to another. Value capture techniques can generate revenue from within transit benefit areas that extend beyond the traditional half-mile-radius "transit areas of influence." Areas benefitting from enhanced mobility, transit accessibility, improved bicycle and pedestrian access, and other transit-induced amenities may extend 2 miles from transit stations.

Value capture is frequently contemplated in the context of transit-oriented development (TOD) projects. TOD is one specific type of the many potential forms of transit-influenced development. TOD is typically composed of vibrant mixed-use development that is amenity-rich and features proximity to transit. Many multimodal features are included in TOD, including pedestrian and bicycle improvements. Numerous studies have demonstrated that under certain circumstances, TOD can command higher sales prices and rents for a variety of property types.

The opportunity for value creation and subsequent value capture will vary by transportation network and station characteristics. Unique characteristics of each transit line and station area will influence the potential for value creation and capture. Significantly different value capture strategies may be appropriate along the same transit line within a single jurisdiction. For example, transit lines and stations in mature and dense urban areas will lend themselves to different value capture strategies than those in greenfield or suburban redevelopment areas.

Local Economic and Market Considerations

The level of transit-influenced value creation varies with local real estate market conditions. These conditions are underpinned by factors such as the size and growth rates of population, income, employment, educational attainment, and national economic conditions and trends. Competition among real estate submarkets is characterized by rates of building permit issuances or starts, occupancy and absorption rates, sales prices and lease rates, retail trade patterns, and other factors. All of these factors, in addition to the density of a particular urban area, may affect the level of value created from real estate around transit.

Successful value capture strategies are dependent on value creation through real estate development. Real estate markets are cyclical and non-uniform. Market fluctuation will affect the rate of value creation and the effectiveness of value capture strategies in any particular period and location. Understanding market dynamics is vital for achieving optimal value creation and designing effective value capture strategies.

Developers evaluate profit potential of transit-influenced real estate value creation along with real estate development risks. Risk factors associated with real estate projects include market acceptance, project complexity, and capital intensity. Investment-relevant time horizons differ markedly among major value capture participants. The most successful value capture strategies will, to the greatest extent possible, align risk tolerances with time horizons and sensitivities among value capture participants.

Regulatory Considerations

Land use regulations and zoning can support and incentivize both value creation and value capture strategies. However, regulations that are ill-conceived, inadequate, or overabundant may act as barriers to value creation. Realizing value creation potential related to transit projects requires that local planning, zoning, and development entities adopt rules that allow for and encourage optimization of the opportunity, including:

- Replacing density maximums with minimums,
- Modifying or eliminating rules requiring segregation of various land uses,
- Reduction of minimum parking requirements, and
- Use of development agreements or similar mechanisms that allow for negotiation of complex value exaction and policy-objective–specific entitlements.

U.S. transit projects that use federal funds must comply with federal regulations, which may affect the nature and extent of value capture opportunities. For example, a range of specific transit development activities are prohibited prior to completion of the National Environmental Policy Act (NEPA) process. Such activities include acquisition of right-of-way that may prejudice consideration and analysis of alternative alignments. Additionally, statutory authority for specific value capture mechanisms and rules controlling their application and implementation vary from state to state.

Articulating the Business Case

Subject to market constraints, new transportation capacity and access create opportunity for increased development. The cornerstone of successful value capture implementation is the clear identification of the economic opportunity associated with (1) real estate projects and (2) embracing a value capture strategy that optimizes benefits both for public and private partners. Developers respond to transit agency investment in infrastructure by evaluating market opportunity for value creation induced by new transportation capacity (or anticipation of such capacity). The large green circle in Figure 1 represents value creation through transit-influenced development.

Some portion of aggregate value creation may be considered market premium (the small green circle), which reflects consumers' willingness to pay higher prices for real estate (residential units, office and retail space, etc.) in close proximity to transit and related amenities than for otherwise identical properties not similarly served by transit. A portion of the transit value premium (referred to as "captured value" in Figure 1) may be recovered through one or more value capture mechanisms.

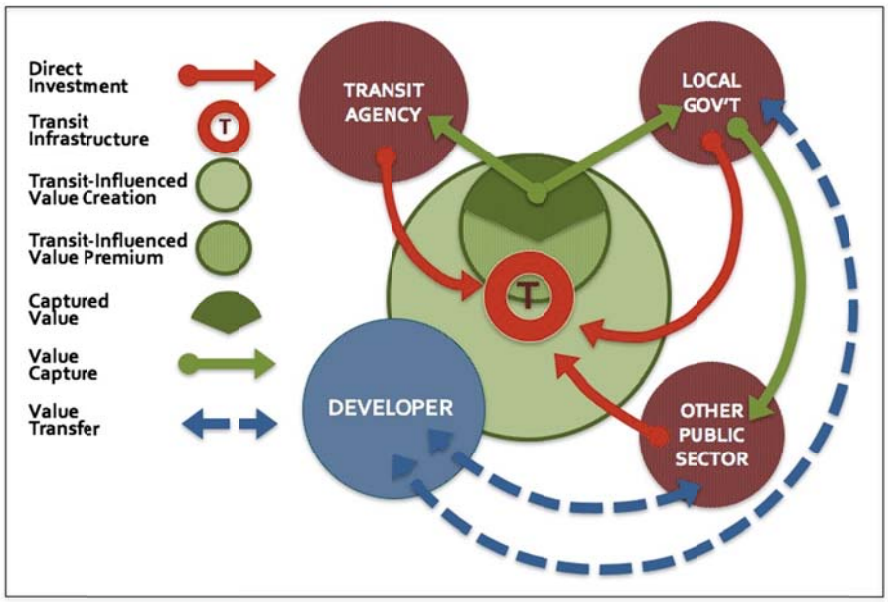


Figure 1. Transit infrastructure investment, value creation and value capture.

From the developer's perspective, the business case for value capture relates to the balance between market opportunity and the cost burden of value capture. Care must be taken that the amount of value captured does not exceed consumers' perceived transit-related value premium. In an efficient real estate market, value capture costs exceeding consumers' increased willingness to pay for transit amenities creates a competitive disadvantage and can disincentivize investment in development and value creation. In practice, these considerations are complicated further by real estate land acquisition, entitlement, development, construction, and financing costs, many or all of which may be higher than those in less complex projects of lower development intensity.

From the perspective of local government, the business case for value capture rests on its ability to fund or finance elements of a transit project, municipal infrastructure, or other public needs. Value capture strategies can allow local government to invest in further enhanced transportation infrastructure, transit supportive infrastructure, expanded transit service, and various public amenities, which can induce additional value creation.

Opportunity for value capture may be maximized to the extent that public and private stakeholders successfully cooperate in strategic value creation. Additional value may be created, and additional public policy objectives may be achieved, through strategic planning and partnership with other public agencies or not-for-profits such as workforce or affordable housing providers. Costs and benefits associated with development of affordable or workforce housing, parks, parking, or municipal infrastructure may be allocated between the parties in the context of development agreements negotiated toward maximizing mutually beneficial value creation.

Development Risks

Value capture projects are subject to a number of risks associated with transit development, construction, and operation, as well as those associated with real estate development. Risks of transit project delay and market downturn during business cycles have frequently been the greatest threats to otherwise successful value capture projects.

Predevelopment speculation may raise acquisition costs for developers and complicate or diminish value capture opportunities. Transportation infrastructure initiatives require significant public involvement, providing advance public notice of infrastructure and development planning. As markets respond in anticipation of future value creation, significant speculative value may be capitalized into land or other real property subsequent to the announcement of new infrastructure and prior to commencement of the new transit service.

Figure 2 illustrates the differential in value creation/escalation following public announcement of proposed transit projects. Although the figure identifies the announcement at a discrete point in time, market-affecting announcements of project planning and progress actually occur at many intervals often over years or decades.

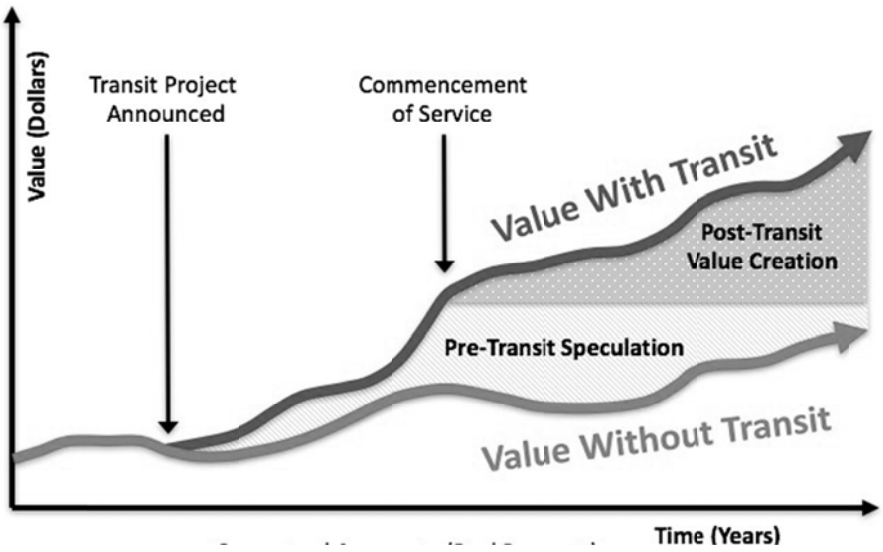


Figure 2. Transit-induced value creation and predevelopment speculation.

Transit agencies must partner strategically with developers and local governments as early as possible in the infrastructure planning process to maximize value capture opportunities. In the absence of early strategic engagement and partnership, speculators may realize much of the land-rent premium induced by prospective public investment by the time transit projects are developed.

Creditworthiness, Finance, and Funding

This guide provides insight into issues surrounding the creditworthiness of transit projects that use value capture mechanisms, and into funding and financing opportunities.

Marketability of debt associated with transit infrastructure is dependent on credit ratings. Credit rating agencies rate debtors' ability to repay debt through timely debt service payments and estimate likelihoods of default. The credit rating potential of debt secured by real estate–dependent revenue streams can improve once stable and dependable performance is demonstrated over 3 to 5 years. However, credit rating agencies have been disinclined to assign an investment grade to debt secured solely by value capture revenue dependent on real estate that has yet to be developed.

Transit agencies or local governments often issue bonds secured by a pledge or assignment of creditworthy sources of repayment in addition to a real estate–dependent revenue stream. Such backstop or standby commitments may be composed of sales or other tax revenues or the full faith and credit of local governments.

Federal programs can accommodate value capture financing. These include the federal credit programs administered through the U.S. Department of Transportation's Build America Bureau, the Transportation Infrastructure Finance and Innovation Act (TIFIA) loan program, and the Railroad Rehabilitation and Improvement Financing (RRIF) program. Although each program currently has its own lending criteria, both TIFIA and RRIF have attractive loan terms that include:

- Low rates of interest that are often below the market rate; and
- Generous and flexible repayment terms allowing for long periods of interest capitalization, significant back loading of repayments, or longer terms.

For many projects where early ramp-up of real estate sales is anticipated or where real estate absorption is uncertain, these programs can provide cash-flow relief. The 2015 Fixing America's Surface Transportation Act (FAST Act) included substantive and procedural changes to both TIFIA and RRIF and expanded their ability to support TOD projects, potentially enhancing value capture projects.

Public and private stakeholders must perform within the constraints and opportunities defined by prevailing public and private financial markets. In many cases, specific projects are financed with combinations of public, private, or quasi-public debt.

Institutional Capacity and Partnership

In order to optimize value capture and transit project feasibility, transit agencies need to engage early in partnerships with developers and local governments and to participate strategically in the process of real estate value creation and realization. Figure 3 illustrates the extensive engagement required between transit agencies, local governments, and developers to optimize value creation and value capture. It also identifies secondary stakeholders that can play a role in augmenting value creation and exchange.

Overcoming TOD Complexity and Risk

The most successful TOD and value capture projects involve:

- Establishing early and substantive dialogue among public entities and between the public and private sectors;
- Developing coherent value creation and value capture strategies between partners sharing common goals requiring the exchange of information;
- Breaching silos of professional practice that limit the sharing of knowledge; and
- Overcoming differences in culture, perspective, and institutional norms.

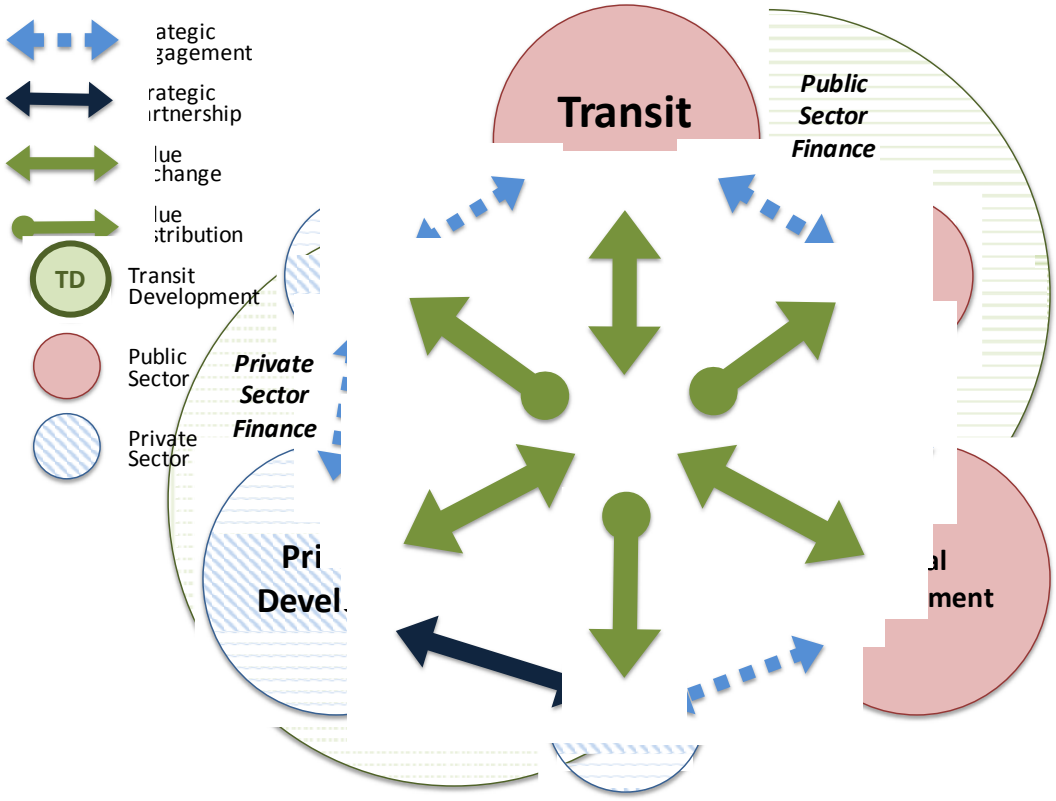


Figure 3. Institutional engagement for transit-induced value creation and value capture.

Case Studies

This guide includes six case studies selected to demonstrate attributes of successful value capture finance projects. These case studies provide insight into strategies and challenges associated with significant funding of streetcar, light rail, heavy rail, and commuter rail projects. The case studies discuss:

- **Boston Landing Station, Boston, MA:** An affiliate of athletic shoe manufacturer New Balance primarily funded a $25 million commuter rail station as a key transportation element for its 15.48-acre office, retail, residential, and hospitality project in suburban Boston.
- **Denver Union Station, Denver, CO:** Several public and one private group realized a $488 million project on 19.5 acres, including the redevelopment of a historic train station and construction of commuter rail, light rail, and bus facilities. Financing was secured primarily by sales tax revenues, TIF proceeds, and an appropriation backstop from the City and County of Denver.
- **Hong Kong Mass Transit Railway Corporation (MTRC), Hong Kong:** While it operates under different mandates and constraints than its U.S. counterparts, the Hong Kong MTRC serves as an illustrative example because it has been able to use the lease of property and partnerships with developers to fund the capital and operating costs of its system, making it one of the few profitable transit agencies in the world.

- **Kansas City Streetcar, Kansas City, MO:** In May 2016, a modern 2-mile, $105 million streetcar system opened in downtown Kansas City, MO. Approximately two-thirds of the construction cost was funded with special assessments, district sales taxes, and parking fees.
- **Portland Streetcar, Portland, OR:** The City of Portland developed a 7.35-mile, $251 million streetcar in downtown Portland, 45% of the funding for which was provided by special assessments, TIF, and parking fees. Value capture revenues provided approximately one-third of project costs. The city allowed development of greater density once streetcar and public infrastructure improvements were completed.
- **Dulles Metrorail, Washington, D.C., region:** Special assessments financed approximately one-fifth of a 23-mile, $5.7 billion extension of the Washington, D.C., region's Metrorail system. Establishment of special assessment districts was accompanied by implementation of zoning and land use changes, allowing for increasingly dense mixed-use development around stations, lower parking minimums, and urban amenities.

CHAPTER 1

Introduction

Value capture refers to a range of strategies for providing funding to infrastructure projects (such as transit projects) from value induced by the project. Value capture is the public recovery of a portion of increased property value created as a result of public infrastructure investment. Common value capture mechanisms are impact fees, joint development, sale or leasing of air rights, land value taxation, station naming rights, negotiated exactions, parking fees, sales tax and special assessment districts, and tax increment financing (TIF).

Given expanding demand for new transit infrastructure and scarce financial resources, U.S. transit agencies are increasingly looking toward innovative funding sources and strategies. Value capture is one of these innovative strategies. Case studies presented in this guide illustrate examples of successful value capture strategies that provide funding solutions for between 20% and 50% of transit project capital costs.

The purpose of *TCRP Research Report 190: Guide to Value Capture Financing for Public Transportation Projects* is to identify for transit agencies, local governments, and developers the opportunities, challenges, and considerations related to value capture as a strategy for funding or financing public transportation projects. The guide:

- Provides definitions of key value capture mechanisms;
- Highlights the importance of local economic and market conditions and regulatory considerations; and
- Outlines elements of compelling business cases from public and private perspectives, articulates funding/financing opportunities, and describes institutional capacities required to deploy various value capture strategies.

This guide may also be of interest to federal, state, and local agencies; economic development organizations; business and community groups; and other stakeholders interested in maximizing the potential for value creation and economic opportunity associated with development that is influenced by transit, including transit-oriented development (TOD).

Transit infrastructure investment often induces value creation in surrounding land and real estate. Realizing the potential of value creation and the value capture it may facilitate requires a number of enabling conditions, as illustrated in in Figure 4.

This guide provides definitions of key value capture mechanisms, highlights the importance of local economic market conditions and regulatory considerations, outlines elements of compelling business cases from public and private perspectives, articulates funding/financing opportunities, and describes institutional capacities required to deploy various value capture strategies.

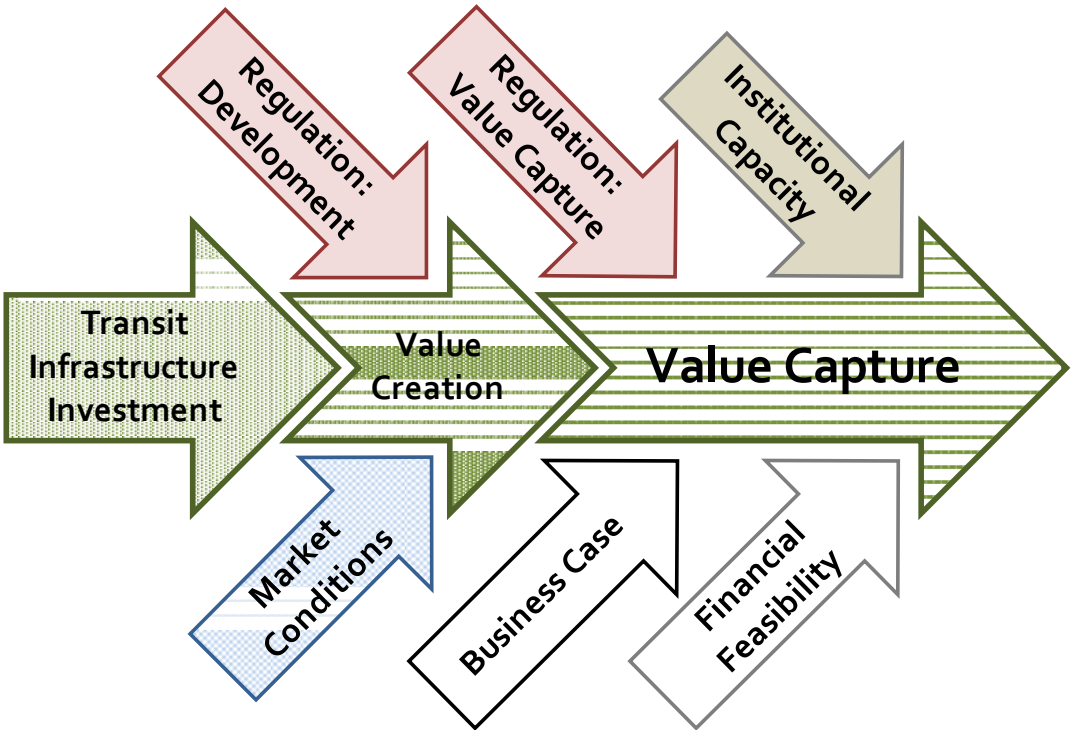


Figure 4. Key elements for successful value capture.

1.1 Background and National Context

Public transportation contributes to the quality of life for many in the United States. In 2014, Americans took 10.8 billion trips on public transportation—the most in 58 years (APTA, 2015b). All modes of transit require capital outlays as well as operation and maintenance costs. Federal, state, and local governments are facing budget constraints resulting, in part, from lowered gas tax revenues, flat or declining sales tax revenues, and increasing needs to fund state-of-good-repair systems following years of deferred maintenance and insufficient infrastructure investment.

Few U.S. transit agencies cover their operating costs through fares. Transit agencies increasingly look to value capture, among a number of innovative funding and finance options, to facilitate new infrastructure projects. Even Hong Kong's Mass Transit Railway Corporation, serving very high ridership through densely populated urban neighborhoods, requires real estate–related non-fare revenues to fund its services.

Successful value capture from TOD and transit-influenced development involves even greater complexity than that associated with typical transportation infrastructure. Thoughtful integration of land use, transit, transportation planning, and project execution is important to transit-influenced development and to generating value that can be captured.

In October of 2014, the FTA issued final agency guidance on joint development and transit, stating that "FTA encourages project sponsors to undertake joint development" and "the pursuit of joint development that can raise revenues for transit systems and enhance transit ridership" (FTA, 2014). In addition, the 2015 Fixing America's Surface Transportation Act (FAST Act) offers additional provisions to help finance TOD.

1.2 Partnerships That Optimize Value Creation

Opportunities and constraints defining the real estate development potential on which value capture depends vary by transit type, station, neighborhood, city, region, and state. Revenue potential, feasibility, and obstacles associated with various value capture strategies will similarly vary from system to system, line to line, and station to station.

Roles required of and assumed by transit agencies will necessarily vary from one circumstance to another. Transit agencies may take a laissez-faire approach to transit-influenced development and value creation or may proactively engage in planning, program facilitation, deal making, direct development, or development advocacy. Optimizing value capture, however, will require that the transit agency assume "an imperative to be involved in a meaningful project partnership with other stakeholders. An effective partnership will need to accommodate the complex financial and organizational issues involved" in real estate planning, design, and execution (Cervero et al., 2004).

The many lifestyle and urban amenity benefits that may be realized from within transit-influenced projects such as TOD result not only from transit access, but also from particularly complex and compact mixed-use real estate development and occupancy. The complexity and intensity of TOD projects can create risk and discourage value-maximizing real estate development and private-sector investment. TOD often requires significant up-front investment in infrastructure and common amenities (Carlton, 2009). Appropriately structured value capture strategies can help to distribute such investment burdens over time, benefitting both developers and local governments. Many of the requirements for successful value creation within TOD fall outside the control of developers and require engagement, collaboration, and partnership with transit agencies and local governments (Hale, 2008). A great deal of cooperative engagement and strategic partnership is required in both planning and execution. A paradigm shift is needed "from current practice of small scope—ad hoc, technical solution driven—planning approach towards a new practice that considers a broad network scope—strategy driven—planning approach" (Arts, Hanekamp, and Dijkstra, 2014).

1.3 How This Guide Fits into Existing Literature

Much has been written about the prospective benefits of TOD, the price and value premiums that can be associated with TOD in certain settings, and the economic justification and financial potential of value capture. Extensive reporting has suggested the need for transit agencies to explore every feasible source of funding and financing and be increasingly creative with deploying solutions. The research team intends for this guide to support interested parties with practical approaches to maximizing value creation and funding transit infrastructure through value capture.

1.4 Methodology and Approach

This guide has been developed to answer the following research questions:

- What are the key issues that transit agencies must address to maximize transit-induced opportunity for value creation, and
- What are the key issues that transit agencies must address to leverage value capture mechanisms to fund and finance transportation infrastructure improvements?

The analytical framework for this guide is based on an exploration of research questions supplementary to the key questions, as identified in Table 1. The research team employed published academic research, secondary sources of material and data, case study interviews, and professional experience.

Table 1. Elements of a business case for value capture.

Primary Research Question	Key Theme	Supplemental Research Questions
How is transit-induced real estate value created?	Local economic conditions	What market conditions are necessary for successful value creation and value capture?
	Regulatory issues	How do regulatory issues affect opportunities for transit-induced value creation and value capture?
How is value capture funding leveraged?	Articulating the business case	How can the opportunity for significant value creation best be structured, and how can the case for private participation in value capture best be framed?
	Creditworthiness, funding, and finance	What comprises a viable value capture credit structure?
	Organization and coordination	What institutional and organizational relationships and partnerships are required to facilitate value creation and maximize value capture?

To supplement publicly available data, the research team prepared the following:

- **Considerations Checklist (Appendix A):** A step-by-step list of considerations for implementing value capture for transit projects. The considerations are grouped into categories and in order of those that are most useful to transit agencies, developers, and other stakeholders for understanding how to undertake transit value capture.
- **Case Studies (Appendix B to Appendix G):** The research team produced a set of case studies that illustrate key concepts addressed in this guide. Appendices B through G present six case studies that highlight the use of value capture for transit projects. All but one of the cases are U.S.-based. The case studies present a variety of value capture funding sources, transit modes, and characteristics (such as station versus corridor or agency versus developer-driven).
- **Interviews (Appendix H):** The research team sought to interview at least three key stakeholders per case study. Where possible, the case studies included interviews with the representatives of a transit agency, local government, and a developer familiar with the project.

Case studies for this guide were selected to highlight how to implement value capture mechanisms for a range of transit projects. Table 2 is a brief summary of the six case studies featured in this guide.

Table 2. Value capture case studies.

Case Study	City	Project Type	Value Capture Mechanisms Used
Boston Landing Station	Boston, MA	New infill station for commuter rail line	Negotiated exactions
Denver Union Station	Denver, CO	Reconstruction of historic station, with light rail terminal, commuter rail terminal, and bus terminal	Special assessment district, sales tax district, tax increment financing
Hong Kong Mass Transit Railway Corporation (MTRC)	Hong Kong	Integrated subway transit and real estate development business strategy	Air rights leases, joint development
Kansas City Streetcar	Kansas City, MO	A 2-mile starter line of a new modern streetcar system	Sales tax district, special assessment district, supplemental surface parking lot assessment
Portland Streetcar	Portland, OR	Modern streetcar system of 16-track miles, built in phases	Special assessment districts and tax increment financing
Dulles Metrorail	Washington, D.C.	A 23-mile extension of the Washington, D.C., Metrorail system	Special assessment districts

1.5 Guide Organization

The guide consists of the following sections:

- Summary;
- Chapter 1: Introduction;
- Chapter 2: Definitions of Value Capture Mechanisms—defines value capture mechanisms and other key terms;
- Chapter 3: Local Economic Conditions and Market Considerations—focuses on the local conditions needed for successful TOD and subsequent value capture;
- Chapter 4: Regulatory Considerations—discusses public policies to consider;
- Chapter 5: Articulating the Business Case—provides the business case for value capture from the viewpoint of the transit agency and the developer;
- Chapter 6: Creditworthiness, Finance, and Funding—describes financing and funding issues central to value capture;
- Chapter 7: Capacity, Organization, and Coordination—discusses how public and private entities need to coordinate and organize to realize value capture;
- Appendix A: Considerations Checklist;

- Appendix B: Case Study: Boston Landing Station, Boston, MA;
- Appendix C: Case Study: Denver Union Station, Denver, CO;
- Appendix D: Case Study: Hong Kong Mass Transit Railway Corporation, Hong Kong;
- Appendix E: Case Study: Kansas City Streetcar, Kansas City, MO;
- Appendix F: Case Study: Portland Streetcar, Portland, OR;
- Appendix G: Case Study: Dulles Metrorail, Washington, D.C.;
- Appendix H: Interviews;
- Acronyms and Abbreviations; and
- References.

The guide has been written to meet the needs of a variety of readers interested in value capture. For readers who are new to value capture, it is helpful to begin with Chapter 2: Definitions of Value Capture Mechanisms and then progress to Chapters 3 through 7. Readers more familiar with basic value capture concepts can focus on Chapters 3 through 7. Chapters 5 and 6 may be of primary interest to readers focusing on business and finance issues. Readers who want to better understand the dynamics of capacity, organization, and coordination summarized in Chapter 7 should read one or more of the case studies. Readers focused on heavy rail or multimodal value capture examples will find the Denver Union Station and Washington, D.C., Dulles Metrorail case studies illustrative. Readers interested in streetcar examples should read the Kansas City and Portland case studies. Readers focused on station development should read the Denver Union Station, Hong Kong Mass Transit Railway Corporation (MTRC), and Boston Landing Station case studies.

CHAPTER 2

Definitions of Value Capture Mechanisms

Following are definitions of strategies and mechanisms commonly associated with value capture in the context of transit infrastructure finance.

2.1 Value Capture

2.1.1 Definition

Value capture is the public recovery of some portion of private property value created as a result of public infrastructure investment. This is not a new concept. The Romans may have assessed wealthy homeowners to finance aqueduct improvements (Zhao and Larson, 2011). In 1427, Henry VI adopted an act assessing differential tax rates on those "whose property derives benefit from the works," related to sewage and sea defenses (Connellan, 2004). John Stuart Mill proposed taxation of the "unearned increment" in 1858. The concept was refined by economist Henry George in 1879 (George, 1879). New York City levied special assessments in 1691 to finance drainage and street improvements. In the early 1930s, New York adopted special assessments, successfully and unsuccessfully, to capture part of the value created by the subway system extension (Hagman and Misczynski, 1978; Raskin, 2013).

Public infrastructure investment can attract private investment in real estate development and lead to the creation of significant real property value. Such value creation can be directed and encouraged through coordinated partnership between transit agencies, local governments, developers, and other entities. The following series of figures (Figure 5 to Figure 9) illustrate the dynamic relationships between various entities, value creation, and value capture in five steps.

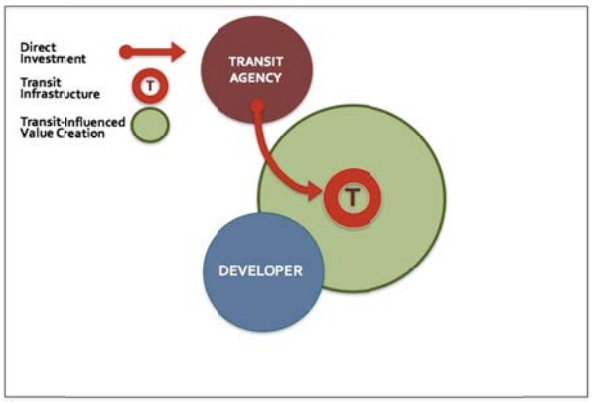


Figure 5. Transit infrastructure investment, value creation, and value capture (Step 1 of 5).

Subject to market constraints, new transportation capacity and access create opportunity for increased real estate development. Developers respond to transit agency investment in infrastructure by evaluating market opportunity for value creation created by new transportation capacity (or anticipation of such capacity). The large green circle in this series of figures represents value creation through transit-influenced development. TOD is a subset of transit-influenced real estate development.

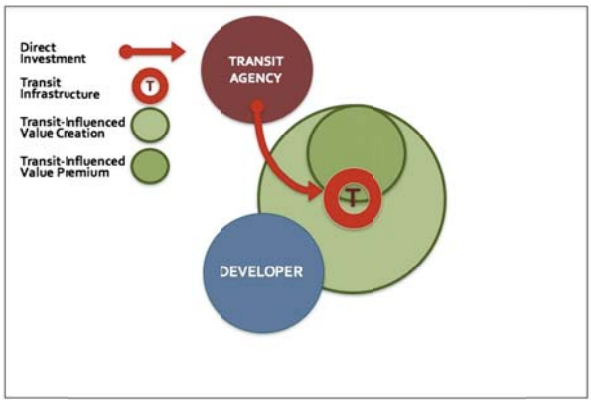


Figure 6. Transit infrastructure investment, value creation, and value capture (Step 2 of 5).

Some portion of aggregate value creation (the larger, light green circle) may be considered market premium (the smaller, dark green circle), reflecting consumers' willingness to pay higher prices for real estate assets (residential units, office and retail space, etc.) in close proximity to transit access and related amenities than for otherwise identical properties not similarly served by transit. Value associated with the transit service/utility, as well as that of other amenities common to high-quality TOD, becomes capitalized into the market price of real property (McIntosh, Trubka, and Newman, 2014; Cervero et al., 2004).

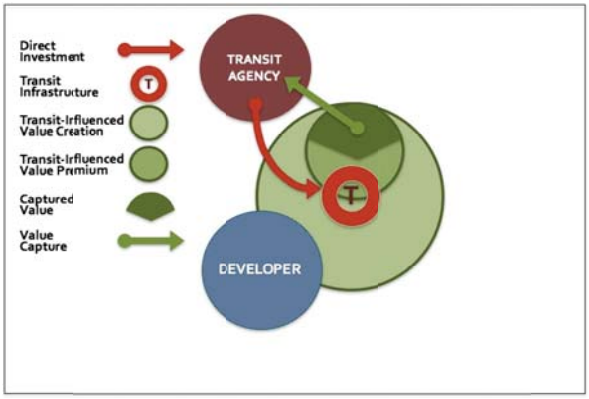


Figure 7. Transit infrastructure investment, value creation, and value capture (Step 3 of 5).

A portion of the transit value premium (here referred to as "captured value") may be recovered through one or more value capture mechanisms. To the extent that value capture imposes additional cost burden on real property, care must be taken that the amount of value captured does not exceed consumers' perceived transit-related value premium. In an efficient real estate market, value capture exceeding consumer's increased willingness to pay for transit amenities will create a competitive disadvantage and disincentivize investment in development and value creation. In practice, these considerations are further complicated by real estate land acquisition, entitlement, development, construction, and financing costs; many or all of these may be higher than those in less complex projects of lower development intensity.

A value capture strategy allowing local government to offset fiscal impacts associated with new real estate developments (such as TOD) and to finance supportive municipal infrastructure can allow local governments to invest in further value creation through enhanced infrastructure, expanded service capacities, and various amenities in the public realm.

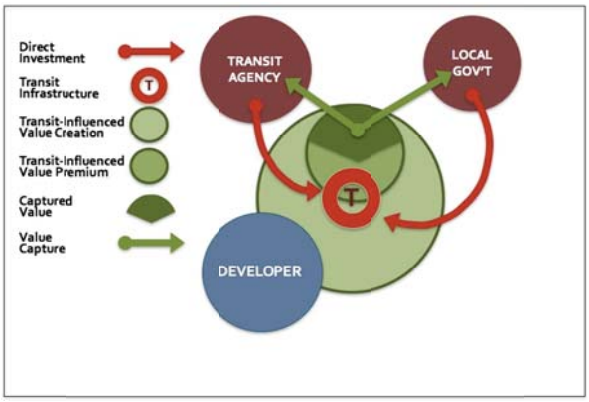


Figure 8. Transit infrastructure investment, value creation, and value capture (Step 4 of 5).

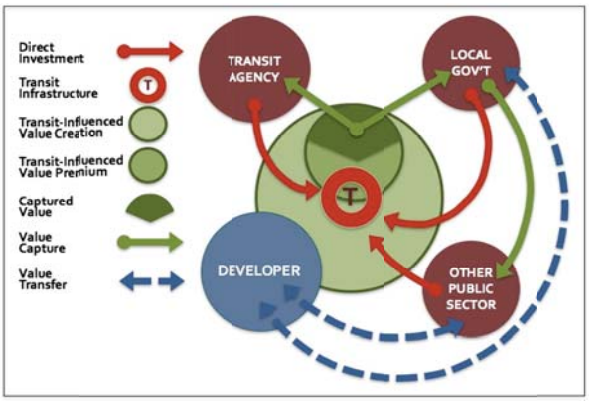


Figure 9. Transit infrastructure investment, value creation, and value capture (Step 5 of 5).

Additional value may be created, and additional public policy objectives may be achieved, through strategic planning and partnership with other public agencies or not-for-profits such as workforce or affordable housing providers.

Costs and benefits associated with development of affordable or workforce housing, parks, parking, or municipal infrastructure may be allocated among the parties in the context of development agreements negotiated toward maximizing mutually beneficial value creation. Opportunity for value capture may be maximized to the extent that public and private stakeholders successfully cooperate in strategic value creation.

Portland, OR, Modern Streetcar Project Example

The first phase of Portland's modern streetcar system was funded in 1996 with an initial infrastructure investment of $103 million. Property and business owners and developers, motivated by opportunities for development, redevelopment, and revitalization of dormant urban areas, embraced local improvement districts and specific forms of special assessment districts as a means to contribute financially to the streetcar project and to see it to fruition.

Billions of dollars in new development have now been realized in proximity to Portland's streetcar corridor. For more details, please see Appendix F.

2.1.2 Value Capture Mechanisms

Value capture usually refers to one or more of a number of mechanisms or strategies such as those shown in Table 3 and described in the following. As Table 3 suggests, value capture mechanisms can often be applied jointly. For instance, the Portland streetcar project used a combination of special assessment districts, tax increment financing, and parking fees. Funding for the Kansas City streetcar included a special assessment district based on property values, sales taxes, and parking fees.

Table 3. Major value capture mechanisms and their applications.

Value Capture Mechanism	Exclusive Application	Joint Application
Air rights		✓
Impact fees	✓	
Joint development		✓
Land value taxation		✓
Naming rights		✓
Negotiated exactions	✓	
Parking fees		✓
Sales tax districts		✓
Special assessments districts		✓
TIF		✓

Adapted from Vadali, 2014.

In many settings, joint development, TIFs, and special assessment districts are "likely to yield the highest revenue" (Mathur and Smith, 2012), and the guide will focus on these.

2.1.2.1 Impact Fees

Impact fees are assessed by local governments against newly developed real estate to offset costs associated with providing infrastructure and service to that development. Impact fees commonly finance roadways, water and wastewater utilities, schools, libraries, and other municipal services. Similarly, transportation impact fees can be used to finance transit or transportation infrastructure. Impact fees are widely used in residential development. Several studies have found that they increase housing prices (Mathur and Smith, 2012).

One challenge associated with impact fees is that they impose additional cost to new development. Everything else being equal, these fees could reduce competitiveness with comparable properties if the associated benefits—higher-quality infrastructure, schools, and other amenities—are not cost-effectively delivered and the value is not clearly communicated (Fogarty and America, 2008).

2.1.2.2 Joint Development

Joint development results from a partnership between multiple parties engaged in a particular real estate development project. In the context of value capture, joint development generally refers to a partnership among an agency, one or more developers, and/or other parties, such as a local government. Such projects often consist of public–private partnerships (P3) to develop land owned or controlled by the transit agency or local government, often within half a mile of the transit facility. Like other value capture mechanisms, joint development seeks to capture what would otherwise be private benefits created through public infrastructure (Zhao and Das, 2012).

Joint development with air rights: Bethesda Metro Station, WMATA: Bethesda, MD

The Bethesda Metro Joint Development (BMJD) project encompasses buildings above the Bethesda Metrorail station in Bethesda, MD. In 1981, the Bethesda Metro Center Limited Partnership entered into a 50-year lease agreement with the Washington Metropolitan Area Transit Authority (WMATA), the regional transit agency. The project contains a 17-story office tower with 368,000 ft^2 of office, 41,600 ft^2 of retail, a 390-room hotel, and a five-story parking garage. BMJD generates minimum annual lease revenue of $1.6 million (Mathur, 2014).

The FTA has published guidelines defining joint development projects for purposes of funding eligibility. Joint development projects under FTA guidance may include residential and nonresidential property physically or functionally associated with public transportation projects. Eligibility for federal funding is subject to several criteria, including that the project should:

- Enhance economic development and/or incorporate private investment,
- Enhance the effectiveness of the associated public transportation project or facilitate enhanced coordination between multiple transportation modes, and
- Yield a fair share of revenue for support of public transportation (FTA, 2014).

Joint development is often composed of complex mixed-use projects involving several parties and designed to achieve multiple objectives. Residential joint development projects may include affordable or workforce housing elements and partnerships with local governments or other public entities in addition to the transit agency. One or more joint development projects may be executed under a master development agreement allowing a single development team to oversee one or more large projects or sites and oversee or coordinate sub-developers or builders.

One potential challenge and limitation of joint development is that the transit agency or local government may own only a fraction of the land supporting value creation near the facility. In many cases, joint development is combined with a broader district approach, like a special assessment district or TIF.

For the purposes of this guide, air rights are considered a subset of joint development. Depending on applicable legislative authority, transit agencies may be able to sell air rights to developers—including developable volume above or even below a transit facility. In general, air rights are applicable in dense urban areas where the additional costs of air rights construction can be borne by higher prices and rents.

2.1.2.3 Land Value Taxation

Unlike commonly administered ad valorem property taxes, land value taxation is a levy on the unimproved value of land, without regard to vertical improvements. Many economists and policy advocates have lauded the merits of land value taxation. The underlying premise is that unlike the value of vertical building improvements such as housing or office space, which are subject to many private choices and investment decisions, the economic value of unimproved land is more directly reflective of the value of public investment in infrastructure. This makes land value the most logical, and perhaps most equitable, source of public revenues. Advocates of land value taxation suggest that emphasizing ad valorem taxation on land rather than building improvements could have wide-ranging benefits with respect to investment behavior and social and economic consequences. Land value taxation is much discussed, and various versions have been implemented in many places throughout the world and in U.S. states such as Pennsylvania and Connecticut. Nevertheless, land value taxation remains uncommon in the United States (Gurdgiev, 2012)

2.1.2.4 Naming Rights

Naming rights are a familiar concept for sports venues and involve an up-front or ongoing payment from a private entity to an agency in return for naming a station or other assets for the private firm. As discussed in the following, naming rights may be appropriate for stations or even entire bus rapid transit (BRT) or light rail lines, as was the case for Cleveland's Healthline and the UC San Diego Blue Line (Greater Cleveland Regional Transit Authority, 2016; University of San Diego, 2015).

2.1.2.5 Negotiated Exactions

Negotiated exactions are direct payments or in-kind contributions by developers to local governments that are used to offset costs imposed by development. Exactions that are negotiated can include infrastructure improvements such as roadway paving and street signalization as well as contributions of equipment or facilities such as fire trucks and park, library, and school

improvements. Exacted negotiations are often set as a condition for granting development approvals for a specific parcel or plan. It is important to note that negotiated exactions need to meet two legal precedents: (1) a relationship, or nexus, between the exaction requested and the needs to government service provision created by the development, and (2) appropriate proportionality between the exaction and the impact imposed by the development.

Much like impact fees, negotiated exactions are commonly viewed as a means of having development pay for the costs associated with its impacts. However, the actual process of negotiated exactions is highly dependent on the specific project context, including the political context of the development and the parties included in the negotiations. As such, negotiated exactions do not lend themselves easily to generalization or direct reapplication in many contexts.

2.1.2.6 Parking Fees

Some local governments and transit agencies have established parking fees to pay for transit, either within the district benefitting from the transit or city-wide. One example is Portland, whose parking fee materially supported its streetcar project. Not all practitioners would consider parking increments value capture since they are not necessarily capturing the increased value of parking.

2.1.2.7 Special Assessment Districts

Special Assessment Districts: Community Development Districts, FL

When developers of master-planned communities in Florida first started to employ community development districts (CDDs) in the early 1980s, developers of competitive projects not subject to CDD assessments successfully marketed against CDD projects because of the higher apparent tax burden. Over time, however, home purchasers recognized the enhanced quality of place that CDDs delivered. Special assessments are likely to be most feasible in areas subject to significant development activity (also subject to special assessment fees) and in robust real estate markets.

Special Assessment Districts: Red Line Benefit Assessment Districts: Los Angeles, CA

The Red Line was Los Angeles Metro Rail system's first heavy rail line. In 1992, voters passed bond measures that created two benefit assessment districts around future Red Line stations. The districts included 1,500 properties, with a total area of over 67 million ft^2. By 2005, the districts were generating $20 million per year in revenue and paid for 9% of the Red Line construction (APTA, 2015a).

Photo credit: Creative Commons.

Local governments establish special assessment districts within which monetary obligations/charges are assessed against real property parcels benefitting from one or more specific public investments. A general requirement of such assessments is that the benefits on which they are based are direct and unique. Special assessment districts assume a variety of forms across jurisdictions but are commonly used to reimburse public infrastructure investment that directly benefits private property. Some form of special assessment has been authorized within all 50 states, allowing local governments to finance a wide variety of infrastructure improvements. Benefit assessment districts and local improvement districts are specific examples of special assessment districts. In one survey, Orrick and Datch (2008) show how specific states define special districts differently, underscoring the importance of understanding local regulations and laws. Assessments may be used to fund a wide variety of municipal infrastructure, such as streets, underground utilities, fire protection equipment, and transit facilities. Additionally, special assessment districts can be used to support ongoing maintenance of streetscaping and landscaping. Kansas City successfully used a Missouri Transportation Development District, a form of special assessment, to fund all operations and maintenance for its 3.9-mile streetcar project, estimated to be $2.8 million annually in 2013 dollars (Kansas City, 2013).

Establishment of a special assessment district commonly requires a majority vote of property owners within the proposed district. Special assessments are generally of fixed duration, sometimes extending to 30 years. Special assessments are often employed outside of transit projects to fund municipal infrastructure and utility capacity. In some jurisdictions, special assessments may also be employed to fund municipal services such as police or fire protection or street lighting. In other jurisdictions, use of special assessment to fund services may be prohibited.

Special assessments must be proportional and directly related to the cost of the infrastructure or service and the benefit to the property owner. Unlike impact fees or negotiated exactions, special assessments can be levied against and generate revenue from existing real estate improvements as well as new development. Imposing assessments on existing properties has different equity and political implications than assessments against new developments alone. Special assessments are sometimes made against only one property class, such as commercial but not residential, for example (Mathur and Smith, 2012).

2.1.2.8 Sales Tax Districts

In a sales tax district, retail entities and other commercial enterprises that are subject to the jurisdiction's sales tax are charged an increment that is dedicated to the transit project. If the effective sales tax rate is not higher than that of competing areas, sales tax districts may not distort real estate markets in the same way that special assessment districts do.

Establishment of a sales tax district may require a referendum of registered voters. The Kansas City Downtown Streetcar Transportation Development District (which enabled a district-wide sales tax) was formed pursuant to the Missouri Transportation Development District Act, §238.200 to 238.280. Following creation of the sales tax district, a separate measure proposing the tax was voted on by citizens within that district (Kansas City, 2012).

TIF: Transbay Center: San Francisco, CA

The Transbay Transit Center is a multimodal transportation and real estate development project that will connect 11 transit systems and provide 3 million ft^2 of new office and commercial space, 100,000 ft^2 of retail and 2,600 homes. Value capture revenues will be generated by this new real estate development. The TIF district around the project is expected to generate $1.4 billion over 45 years (APTA, 2015a).

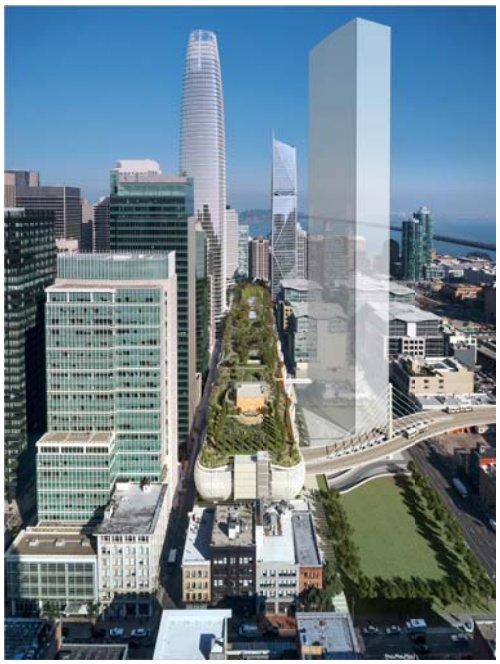


Photo Credit: Transbay Transit Center, 2016.

2.1.2.9 Tax Increment Financing

Local and state governments establish TIF districts within which ad valorem tax revenues are capped for a period of time for purposes of remittance to the local government's general fund, based on the total assessed value within the district on a specified date. Thereafter, tax revenues resulting from increases in assessed value—the "increment" induced through public and private investment—are used to reimburse infrastructure investment either directly or via bond debt service payments, as shown in Figure 10. TIF financing has been used extensively in the United States to finance a wide variety of infrastructure and redevelopment projects. In transit-specific projects, TIF has been used to finance station infrastructure, structured parking facilities, and related infrastructure. TIFs may also be used to finance municipal infrastructure and other public investment associated with TOD. Many (but not all) states authorize TIFs.

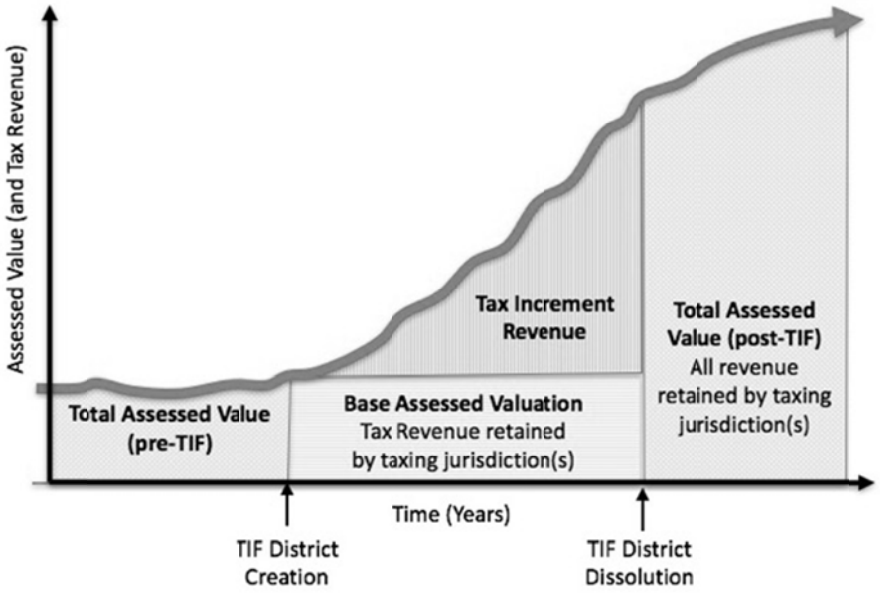


Figure 10. Tax increment finance value capture mechanism.

Because the tax increment is derived from the total increase in ad valorem assessments—on all properties—within the district, benefit is derived from market appreciation of existing and renovated properties as well as the incremental value of new development. On the other hand, assessed values tend to be somewhat murky, subject to political and policy agenda, and lag real-time changes in market value (Case and Wachter, 2005), reducing confidence in this technique as a financing source.

TIF financing of transit-influenced development or TOD can mitigate costly up-front obligations to developers or the local government. Such financing can provide development incentives in addition to those resulting directly from proximity to transit. TIF is of even greater value where transit stations will serve new, as opposed to existing, development. This is because every dollar of new, additional assessed valuation will contribute to the TIF revenue stream, and values of vacant land or blighted or underutilized property are likely to be less than those of existing and fully occupied buildings.

Establishment of a TIF district commonly requires a finding that the proposed development, redevelopment, or economic development project would not occur except for the investment facilitated through TIF. Successful TIF is explicitly dependent on the project's success in raising assessed real estate values within the district. Failure of assessed values to increase could jeopardize TIF-backed bond repayments. Because of this, TIF bonds are often secured by general or other obligations of government in addition to the TIF increment or some other type of backstop. This is a critical issue in using TIF as a financing mechanism.

A form of such a backstop is a synthetic TIF, in which the increment is not pledged directly to bondholders. Instead, bonds are secured through a local government general obligation, which uses the increment to satisfy that obligation. Charlotte, NC, for example, has employed a version of synthetic TIF to finance TOD improvements. Under the Charlotte TIF, developers advance

capital for infrastructure investment and are reimbursed from incremental tax revenues earmarked for the purpose (Fogarty and Austin, 2011).

The complexity of TIF requires extensive financial and fiscal impact analyses. “Creating and maintaining a TIF district requires significant institutional capacity. TIF is complex, often requiring the expertise of municipal-bond financing experts, economic development experts, real estate appraisers, civil engineers, financial analysts, and consulting planners” (Mathur and Smith, 2012).

Several states are considering legislation that fosters TIF along rail corridors that cross municipal boundaries. This legislation includes SB077 in Illinois, which allows for TIF in certain “redevelopment project areas,” including the Chicago Union Station Master Plan and the Chicago Transit Authority's Red and Purple Modernization Program, Blue Line Modernization and Extension, and Red Line (Illinois General Assembly, 2015). Similarly, Massachusetts is considering legislation that would allow corridor-based TIF that could be used to help fund the Green Line light rail extension and potentially other Massachusetts Bay Transportation Authority (MBTA) transit projects (Commonwealth of Massachusetts, 2016).

2.2 Value Capture Participants

Three major participants in projects with value capture are defined in the following sections: the transit agency, developer, and local government. As discussed throughout the guide, there are numerous other public and private entities that play a role in value capture success.

2.2.1 Transit Agency

For purposes of this guide, a transit agency is a public entity whose primary purpose is to plan, construct, operate, maintain, and (usually) finance public transportation services in a particular jurisdiction, usually within a local government or in a region consisting of a group of local governments (a metropolitan region). These include the 834 organizations recognized by APTA that operate a public transportation system in an urbanized area (APTA, 2015a). Transit agencies can be organized as departments of a local government or as separate public authorities.

2.2.2 Developer

For purposes of this guide, developers are construed as private or not-for-profit entities that invest in and effect the improvement of real property. This includes coordination of real estate development activities such as the purchase of land, improvement of land (vertical or infrastructure), renovation of existing improvements, and sale of the improved land or parcels to others. The developer may or may not be the property owner.

2.2.3 Local Government

For purposes of the guide, a local government is the municipality providing municipal goods, services, and infrastructure in the area served by the subject transportation project. A local government also includes any government entity with the right or obligation to levy local/municipal tax obligations on real property benefitting from a transportation improvement.

2.3 Public Transportation Modes

This guide applies to many modes of public transportation, including BRT, commuter rail, heavy rail, light rail transit (LRT), and streetcars. The concepts and principles articulated in the guide also apply to intercity transportation, including intercity and high-speed rail and stations serving private intercity buses.

While BRT is an emerging mode in the United States, recent research suggests that high-quality BRT service, delineated as "silver" or "gold" standard service (Institute for Transportation Development and Policy, 2014), can result in TOD similar to that which is induced through LRT and streetcars (Nelson and Ganning, 2015).

2.4 Transit-Influenced Development and Value

Value capture opportunities may be associated with many types of transit-influenced development or with other transportation infrastructure investment. TOD is a type of transit-influenced development most often associated with value capture initiatives.

2.4.1 Transit-Oriented Development

TCRP Report 102: Transit-Oriented Development in the United States observes that there is no universally applicable definition of TOD (Cervero et al., 2004). Definitions evolve over time, as does the concept itself, and vary from place to place depending on context. However, common elements of TOD include:

- **Integrated Design:** TOD consists of vibrant, pedestrian and bicycle-friendly, amenity-rich, mixed-use development benefitting from proximity to transit. TOD generates and benefits from significant transit ridership. TODs are relatively high-density developments incorporating residential, retail, office, institutional, and civic spaces. TOD is often of high quality, planned for sustainability and economic vitality, and designed to take advantage of market opportunity created by transit users and others.
- **Value Creation:** TOD creates opportunity for significant value creation. For example, new stations can stimulate development of previously underutilized sites. Municipal planners may allow development of higher-density development and more intensive mixed use near stations. New facilities may induce additional public investment in infrastructure beyond transit. The transit amenity may enhance marketability of new or renovated residential units, office, and retail space (Fogarty and America, 2008; Gihring, 2009).
- **Premium:** Numerous studies have demonstrated that under certain circumstances, TOD can command sales price and rent premiums for a variety of properties (McIntosh, Trubka, and Newman, 2014). Consumers' willingness to pay higher prices for TOD amenities can help to offset increased development costs associated with higher densities and mixed use (Cervero et al., 2004; TCRP, 2004).

2.4.2 Transit Areas of Influence

Transit areas of influence are defined as the spatial areas in which transit infrastructure typically has the greatest impact on land use and development and from which there is high potential to generate transit ridership (APTA 2009). APTA defines "transit areas of influence" as those "spatial areas in which transit stops and stations typically have the greatest impact on land

use and development and from which there is high potential to generate transit ridership." (APTA, 2009). APTA "provides guidance on delineating these areas for the purposes of influencing decisions about private and public investments and services." The research team has adopted APTA's definition of transit areas of influence for use in this guide. In site and context-specific application, however, the nature and extent of transit influence on value creation and the surrounding built environment will vary by alignment, station location and design, station typology, competitive market, and other factors. APTA defines three spatial definitions of transit areas of influence (see Table 4).

Table 4. Transit area of influence definitions.

Type	Definition	Station Area Radius
Core station area	The area around a transit station within which land use and urban design features have a primary influence on transit ridership and pedestrian access.	¼ mile
Primary catchment area	The area within which land use and urban design features, as well as the ease and directness of access to the stop or station, have a substantial impact on transit ridership and pedestrian access. The primary catchment area may generate a significant portion of total transit trips to and from the stop or station.	½ mile
Secondary catchment area	The area around a transit station within which ease and directness of access to the stop or station have the greatest influence on transit ridership and within which the majority of all trips using the stop or station are generated. Within this area, bike, feeder transit, and auto are the primary access modes to and from the station.	2 miles

Source: APTA, 2009.

Value capture may also be effectively applied to real estate that falls within secondary catchment areas. This includes existing properties located beyond the typical one-half-mile radius of a transit station, where value is often captured through special assessment districts, impact fees, or other techniques. The real estate in this area may be of a more traditional format, including office buildings constructed in park-like settings, such as along the Dulles Metrorail, or single-family detached homes as proposed in Miami (Scurr and Page, 2015).

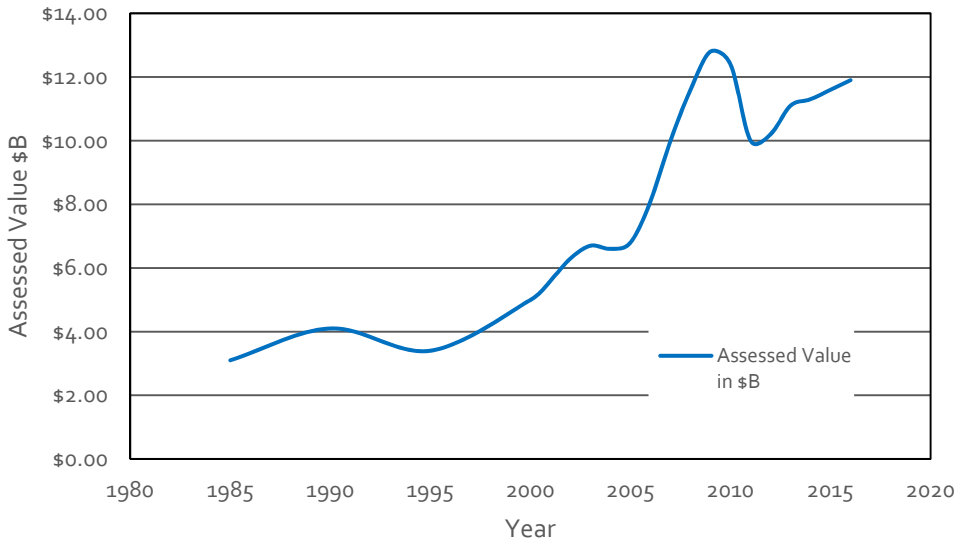
The concept of transit areas of influence can also extend to pedestrian and bicycle improvements. The FTA published a final policy statement on the eligibility of pedestrian and bicycle improvements that identifies a functional relationship of half a mile for pedestrian improvements near a transit facility and 3 miles for bicycle improvements (FTA, 2009). This policy recognizes a de facto relationship between pedestrian improvements and public transportation. The policy also recognizes that pedestrian and bicycle improvements beyond these distances may also have a functional relationship to public transportation, but such relationships must be demonstrated. The importance of this policy for value capture is to illustrate that the concepts of areas of influence and catchment areas for transit, pedestrian, and bicycle improvements are context-specific but are becoming general industry guidelines.

CHAPTER 3

Local Economic Conditions and Market Considerations

Successful value capture strategies are dependent on value creation through real estate development. Real estate markets are cyclical, and market cycles are not coincident between different classes of real estate. Fluctuating markets will affect the rate of value creation and the effectiveness of value capture strategies in any particular period and location. The effectiveness of value capture is dependent on the vigor and timing of relevant real estate markets. Understanding economic and market dynamics is vital to achieving transit-induced value creation and to designing effective value capture strategies.

As discussed in the Dulles Metrorail case study, the project corridor experienced three major business downturns during the period in which the project was planned and organized. Changes in assessed value of commercial/industrial property over time are shown in Figure 11. While the assessed value in this area has grown appreciably, the downturn in the early 1990s was devastating to many businesses and could have derailed support for the project.



Source: Fairfax County Economic Development Authority, 2016.

Figure 11. Assessed value of taxable commercial/industrial property in the Phase 1 Transportation Improvement District of the Dulles Metrorail case study (in $ billions).

3.1 Local Economic Conditions and Market Considerations

Beyond economic factors, market area demographics, in addition to national trends, influence the vitality of local real estate markets. These include:

- Population, income, and employment in absolute size and growth rates;
- Levels of educational attainment, wages and wage growth, and rates of job creation; and
- Age and other demographic factors influencing household creation rates.

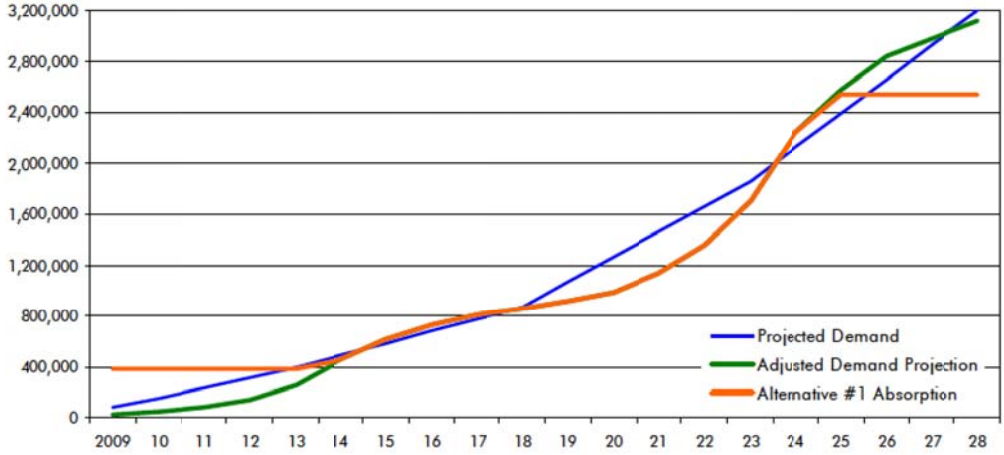
Specific trends defining local real estate market conditions include:

- Rates of housing permit issuance or starts,
- Occupancy rates,
- Real estate price trends,
- Office space absorption rates, and
- Retail trade patterns.

Factors influencing market conditions affecting a specific value capture project may include:

- Prospects for corporate relocation,
- Significant employment growth,
- The level and vibrancy of real estate market activity predevelopment, and
- Major planned competing developments.

The City and County of Denver commissioned CB Richard Ellis (CBRE) to carry out an absorption feasibility and site-specific study for the Denver Union Station project (CBRE, 2009). The study analyzed demographic, economic, and growth trends in major real estate markets relevant to the project, including office, retail, hotel, and multifamily residential. Figure 12 provides an example of a demand projection in the Denver Union Station study area.



Source: CBRE, 2009.

Figure 12. Example of Denver Union Station study area commercial demand and absorption projections, 2009–2028.

The study further evaluated regional, submarket (a smaller and more defined sector of the overall market), and study area trends, including demand projections, current supply, and pipeline of new projects and absorption rates in the critical office and residential markets in the study area. Figure 13 shows an example of a submarket map used in the Denver Union Station analysis.

Source: CBRE, 2009.

Figure 13. Example of central business district (CBD) and lower-downtown (LODO) submarket boundaries.

3.2 Density Considerations

The existing density of an area may affect both demand and market acceptance of any new form of value maximizing transit-influenced development. Density may also influence developers' perception of risk related to complex, capital intensive, mixed-use TOD. In general, value capture has the greatest potential in densely developing urban areas due to the ability to attract more foot traffic into retail establishments and more taxable square footage of commercial, housing, and office uses (Vadali, Aldrete, and Bujanda, 2009).

Where land for development is constrained, transportation options are limited or expensive, and competitive/non-TOD submarkets are of densities and price points similar to those in TOD, developers may embrace significant TOD densities and complex mixed-use real estate in anticipation of TOD price premiums. In such cases, it may be easy to make the business case for participation in value capture projects. Alternately, in instances where land for development, automobile ownership, travel, and parking is plentiful and inexpensive, developers may perceive significant additional market risk both in pursuing optimal TOD yield and in embracing value capture.

3.3 Network and Station Characteristics

In addition to market-wide and submarket influences, the opportunity for transit-influenced value creation and subsequent value capture will vary by transportation network and station characteristics. In considering TOD placement and estimating value creation, the type of

transportation network is important. For example, heavy rail transit is characterized by high passenger capacities and frequent service. This transportation mode will generate very different trip volumes and patterns from commuter rail, which travels at higher speeds, covers longer distances, and varies service based on commuting patterns. These trip volumes and patterns help determine the level of street activity around a station and subsequently the level and type of development that can be supported near the station.

Unique characteristics of site and location will influence the potential for value creation and capture at each station. Even assuming relatively uniform levels of demand and economic opportunity across any particular transit line, mature urban station locations, greenfield development sites, brownfield redevelopment sites, and predominantly park-and-ride station locations will produce different levels and types of development opportunities. Even along the same transit line within one local government, significantly different value capture strategies may be appropriate, as summarized in Table 5.

Table 5. Value capture mechanisms by station type.

Station Type (Example)	Value Capture Opportunity
Mature urban locations (Metro Center in Washington, D.C.)	Densely developed; increased density realizable only through up-zoning; more difficult to impose special assessments; naming rights and some joint development may be possible
Greenfield (Dulles Metrorail in Washington, D.C., region)	Greatest opportunity for new development, dependent on land use and zoning changes; transit agency may own property for joint development, and special assessment district could be implemented with property owner cooperation
Brownfield (Denver Union Station)	Depending on neighborhood, TIF may be most applicable; joint development could also be attempted if the transit agency or local government owns nearby property
Park and ride (Eagan Transit Station in Minneapolis, MN)	Like greenfield yet with more limited short-term development opportunity; depends on surrounding planning since access to station may be limited to cars or infrequent buses

3.4 Timing

Timing can be a significant issue for effective value capture. As shown in Table 6, timing perspectives can differ among primary value capture participants. Transit agencies have a long-term perspective of a decade or more, reflecting the length of time required to plan and construct major facilities. Local governments can have similar time horizons, although they are often affected by the term of major political office holders, which tend to have a 2- or 4-year

Eagan Transit Station: Minneapolis-St. Paul, MN

The Eagan Transit Station in the Minneapolis–St. Paul region provides non-express bus service from a 750-space suburban parking facility to downtown Minneapolis. The Minnesota Valley Transit Authority entered into a 50-year ground lease with a private developer for 15,000 ft^2 of on-site retail, which includes a coffee shop, a bagel shop, a restaurant, and a hair salon (Minnesota Valley Transit Authority, 2016).

cycle. Developers, on the other hand, are highly affected by these unpredictable real estate cycles. Real estate developers are also subject to highly competitive and fast-changing markets, resulting in an environment quite different from that in which transit agencies commonly operate.

Such differences in time horizons, culture, and risk perspectives must be acknowledged and bridged to the greatest extent possible. These opportunities and challenges are discussed further in Chapter 7.

Table 6. Value capture timing issues.

Entity	Timing Perspectives
Transit agency	• Typically, 10 to 20 years, reflecting period to plan and construct major transit facilities • Some agency staff may be politically appointed or affiliated and, as such, may have a strong desire to implement projects within an election cycle.
Local government	• Short-term: 2 to 4 years, reflecting political cycles • Long-term: 10+ years, reflecting planning periods
Developer	• Typically, 2 to 5 years (or less), reflecting typical real estate cycles • Some master plan developers or those with considerable local interest may have much longer time horizons, as in the Boston Landing Station case study.

CHAPTER 4

Regulatory Considerations

> The property value premium that transit generates cannot be realized unless there are supportive public policies in place that are targeted toward leveraging transit's added value through measures such as density bonuses, reduced parking requirements, and incentives for TOD. Good planning and supportive policies can help to maximize the overall value of property within a station area (Fogarty and America, 2008).

Enabling and supportive public policy sets the stage for effective value capture. Effective regulations related to land use, such as zoning and development, along with enabling statutory authority, can allow, support, and incentivize value capture. However, some regulations can also serve as barriers to value capture. Assessment of existing and new regulations or changes in regulations should include careful examination of policies and regulations affecting transit development. This chapter introduces policies to be considered due to their ability to affect the effectiveness of value capture.

4.1 Zoning, Land Development Regulations, and TOD Design Standards

Realizing the value creation potential of development near transit requires local planning, zoning, and development entities to adopt rules that allow for and encourage optimization of the real estate opportunity. Options include:

- Replacing density maximums with minimums;
- Eliminating rules requiring segregation of various land uses or tenancies;
- Eliminating, reducing, or altering minimum parking requirements;
- Replacing building setback lines (establishing how far a building must be located from the street) with build-to lines (requirements that frame the street, creating a more inviting urban fabric); and
- Requiring new roadway cross-section standards and typologies.

One illustration of how to use zoning as an incentive for development is the Portland streetcar project. For this project, the developer of a major property along the new streetcar line was allowed to increase density incrementally as a major viaduct was torn down, the streetcar became operational, and a new park was developed (see the case study in Appendix F for more information).

> TOD success can hinge on rewarding developers with measures that grant more latitude in designing projects; allow mixing of uses; increase density envelopes; and offer certainty, clarity, and built-in assurances that the public sector will follow through on planning commitments. Because of the risks sometimes encountered in building near transit stations, especially with infill and redevelopment projects, and because of the public good conferred by TOD, "business as usual" should not apply to TOD developers. Zoning must often be revised to allow higher-than-average densities and a land-use program and mix that satisfy market demands (Cervero et al., 2004).

In the Dulles Metrorail project, the Phase 1 Transportation Improvement District (TID) that provided much of the local special assessment district funding underwent a zoning and land use change with significant up-zoning. This allowed for higher buildings and greater densities around transit stations. Furthermore, parking requirements were reduced (as shown in Table 7). For instance, whereas developers had to provide at least 2.6 parking spaces per 1,000 ft^2 of office space in the previous plan, they did not have to provide any spaces if their building was within a half-mile of one of the four Dulles Metrorail stations. This represented a significant shift in land use policy for a typical suburban office development.

Table 7. Parking ratios for Phase 1 TID that supported Dulles Metrorail.

Use	Previous*	< 1/8 Mile Metro Station**	1/8–¼ Mile Metro Station**	1/4–1/2 Mile Metro Station**	Non-TOD**
Townhouse	**2.75**	1.75–2.2	1.75–2.2	2.0–2.5	2.0–2.7
Multifamily (MF) 0–1 bedroom	**1.6**	1.0–1.3	1.0–1.3	1.1–1.4	1.1–1.4
MF 2 bedroom	**1.6**	1.0–1.6	1.0–1.6	1.35–1.7	1.35–1.7
MF 3+ bedroom	**1.6**	1.0–1.9	1.0–1.9	1.6–2.0	1.6–2.0
Hotel	**1.08**	None–1.0	None–1.0	None–1.05	0.85–1.08
Office	**2.6**	None–1.6	None–2.0	None–2.2	2.0–2.4

*Per unit or 1,000 ft^2. **Minimum–Maximum

Source: Fairfax County, 2014.

4.2 Statutory Authority for Value Capture Mechanisms

Statutory authority for specific value capture mechanisms and for rules controlling their application and implementation varies from state to state (Orrick and Datch, 2008). In some jurisdictions, authorization is governed at the local level. In other jurisdictions, state-level authorization is required. Specific statutory authority or local authorization may be required for the application of value capture mechanisms such as TIF, special assessment districts, impact fees, and joint development.

4.3 Municipality Fiscal, Political, and Regulatory Characteristics

The fiscal condition and political setting of the local government may inform the choice of value capture mechanism in any particular time period and jurisdiction. Alternative value capture solutions may present both fiscal and political challenges and opportunities. Adjoining transit stations may be subject to different political and regulatory jurisdictions requiring different value capture solutions, creating varied development and multi-station opportunities. For example, TIF revenues may be limited by requirements that tax revenues flow to school districts or other municipal functions.

4.4 Compliance with Federal Regulations

Transit projects in the United States that use federal funds must comply with federal regulations. Such compliance may impose additional risks and costs for transit projects, regardless of whether value capture is used. For example, if a project includes federal involvement, then all parties must carefully consider the impact that the environmental clearance process can have on projects that use value capture. The federal environmental clearance process, as mandated by the National Environmental Policy Act (NEPA), prohibits certain project-related activities prior to completion of the environmental clearance process. Prohibited activities include acquisition of right-of-way and parcels of land that may prejudice the required analysis of transportation alternatives. Therefore, the combination of some value capture mechanisms, such as TIF, and projects that require federal environmental clearance can prove to be problematic for ensuring that development rights are secured within an adequate (or appropriate) timeframe so that additional value needed for value capture can be generated from the development. However, implementation of other value capture mechanisms, such as special assessment districts, actually benefit from the NEPA process. Obtaining NEPA clearance for a project sends a strong signal to the private development community that a public project sponsor is committed to project completion. This level of demonstrated commitment to a project can bolster private-sector confidence and raise support for implementation of a special assessment district because the private sector has a level of assurance that the project will proceed and the resulting market value increases will be realized.

4.5 Regulatory Influences on Transit Project Design and Execution

“Successful TODs emphasize ‘placemaking:’ creating attractive, memorable, human-scale environs with an accent on quality-of-life and civic spaces” (TCRP, 2004). In the example of the Dulles Metrorail project, the Fairfax Comprehensive Plan Amendment showed the intent to create a walkable and bikeable, urban-like community, with attractive streetscapes, outdoor eating, and parks, among other amenities (Fairfax County, 2014). These amenities require investments that are largely borne by developers though additional assessments. While this is not the topic of this guide, these additional costs could theoretically make the transit-influenced development less competitive with other districts. However, if the benefits of transit and other street-level improvements are reflected in higher property values, then the added costs for developers can be offset.

CHAPTER 5

Articulating the Business Case

> Through effective partnerships [between] transit agencies, local government, and others, and under the right conditions, all parties are in a position to reap the financial gains conferred by well-planned and well-managed TOD (Cervero et al., 2004).

The cornerstone of successful value capture implementation is the clear identification and articulation of the economic opportunity and competitive advantage associated with (1) maximizing the character, quality, and yield of projects nearby transit, such as TOD, and (2) embracing a value capture strategy that optimizes benefits both for public and private developers.

This chapter focuses on how to structure the opportunity for value creation and how to frame the case for public and private participation in value capture.

5.1 Incorporating Risk

Value capture projects are subject to a number of risks reflecting the exigencies of the infrastructure development, construction, and operations as well as those typical of the real estate industry. Table 8 identifies a number of typical risks to which value capture projects are subject.

Project delay is a risk common to many large transportation projects and occurred in several cases described in this guide. Delays are often costly due to project cost inflation. Furthermore, delays impose an opportunity cost since developers cannot develop or can only partially develop the real estate assets related to the value capture project.

Additionally, risks associated with the various revenue streams that are used for a project are also common. Some of this risk can be managed through risk sharing strategies such as backstops from public agencies other than the project sponsor. In the Denver Union Station project (as will be further discussed in the case study in Appendix B), multiple public partners were involved, and the City and County of Denver provided a backstop for the project's Railroad Rehabilitation and Improvement Financing (RRIF) loan, sponsored by the Denver Union Station Project Authority. The sources of repayment for the RRIF loan included funds from the Regional Transportation District (RTD), tax increment revenues, a levy on property tax revenues, and lodger's tax revenue.

The challenge in using creative backstops is that the current financial market limits its acceptance of backstops to those that are clearly investment grade, as discussed in Chapter 6, including property taxes, sales taxes, and gas taxes. In the future, the market may become more comfortable with backstops based on future real estate revenues or other innovative funding sources with strong historical examples of the stability of such cash flows and appropriate financial structuring that give a high degree of confidence in the availability of these revenues in downside cases.

Table 8. Typical value capture project risks and impact on stakeholders.

Typical Value Capture Project Risks	Developer Impact	Transit Agency, Local Government Impact	Comments
Transit project delay	③ ③ ③	③ ③ ③	Affects all parties
Transit project cost overrun	③	③ ③ ③	Transit agency usually takes responsibility for project delivery; however, higher costs could lead to project delay or change in project scope.
Transit project scope change (i.e., stations changed, reduced service, phasing instituted)	③ ③	③ ③	Depending on nature of change, this could have minor or major impact on all stakeholders.
Expected zoning and land use changes not enacted, including up-zoning	③ ③ ③	③ ③	Major impact to developer; others affected if they depend on development revenues
Major economic downturn resulting in lower TIF monies or lower special assessments	③	③ ③ ③	Could affect local government if funds were to be used as a backstop for TIF or bond holders who took on risk associated with a special assessment district
Major economic downturn resulting in lower rents or value of development parcels	③ ③ ③	③③	Major impact to developer; others affected if they depend on development revenues
Real estate project delay	③ ③ ③	③ ③	Major impact to developer; others affected if they depend on real estate revenues or ridership from development
Higher transit operating costs	③	③ ③	Impact to transit agency; could affect developer if service subsequently curtailed
Higher real estate project operating costs	③ ③	③	Impact to developer; impact to transit agency and local government if this results in real estate project financial distress

Key: ③ = less impact; ③③③ = more impact.
Source: FHWA, 2013.

5.2 Business Case for Transit Agencies and Local Governments

For transit agencies and local governments, the core issue related to the business case for value capture is how to use value capture to help fund a transit project while demonstrating to public and private stakeholders that value capture is the most appropriate tool for funding the project. Table 9 illustrates some of the questions that a transit agency or local government might address when articulating the business case for the project.

Table 9. Elements of a value capture business case for transit agencies and local governments.

Element	Key Questions to Be Addressed
Transit	• Does the project clearly support a demonstrated transportation need? • Is the project in congruence with the needs of the transportation network (i.e., create a needed connection)? • Could the project be built without value capture? Is other public funding available?
Planning and regulation	• Does the project comply with long-range transportation and land use plans? • Does the project address economic development needs within the area? • Are regulatory issues adequately addressed?
Potential for value to be generated	• Are TOD alignment opportunities economically compelling? • Is land publicly or privately owned and is land assemblage[1] required? • Have station locations been determined? To what extent will the planning process reveal the station locations, affecting purchase negotiations?
Potential for value to be captured by value capture mechanisms	• Is enabling legislation in place for value capture mechanisms? • Of the value capture mechanisms that are allowable, which are most favorable for the scope, scale, and projected value of the project? • Is there high potential for strong political opposition?
Private partner interest	• Have developers proposed joint development or made serious inquiries? • Is there strong interest at industry forums? • Will developers consider reduced land prices in return for density bonuses?

1) Land assemblage involves the joining of contiguous lots to make a larger parcel of developable land. Government agencies, such as transit agencies, may have a need for land assemblage in order to accommodate development of significant scale and footprint such as for housing and transit facilities.

5.3 Business Case for Developers

Developers will participate in value capture to the extent that the cost of such participation is more than offset by realizable market value or competitive advantage. Although the premium

afforded by proximity to transit is often substantial, the TOD investment opportunity may be tempered by higher costs, complexities, and risks.

It is important for transit agencies and local governments to note that "many developers embrace TOD as a concept; however, there is a general agreement that TOD offers little help when it comes to securing conventional debt financing. Loan decisions…are governed by fundamentals, not urban planning concepts" (TCRP, 2004). In most cases, the real estate project itself needs to be financially sound before a developer moves forward.

Where transit investments will create opportunities for developers, effective value capture strategies must demonstrate the potential to create more value for developers—or reduce risk, uncertainty, and competitive disadvantage—than they cost. Direct customers of developers such as homeowners and business owners may realize prospective real property value increases only in the distant future when properties are sold or refinanced. This may make it difficult for them to underwrite the cost of higher operating and ownership costs associated with value capture instruments, such as special assessment districts, in the short- and medium-term.

Some part of that value created by transit infrastructure may be considered as premium in the sense that real estate assets near transit command higher prices than those of competitive properties not similarly served by transit and complementary amenities. Premium prices reflecting consumers' increased willingness to pay for transit accessibility have been demonstrated through numerous academic and real estate market price studies. To the extent that price premiums are sufficient to offset elevated predevelopment land acquisition costs and any development, construction, or finance cost disadvantages with respect to competitive submarkets, a portion of the value reflected by that premium can be captured by the public to help pay for the transit development without creating competitive disadvantage.

Most developers put together a business plan, either formally or informally, to justify their involvement in a real estate project involving value capture. This plan addresses many of the issues discussed here and throughout the guide from the developer's perspective.

Table 10 presents typical elements of a developer's value capture business plan, covering the nature of the transit project, regulations, market interest in the value capture opportunity, and financial return.

As discussed in Chapter 4, addressing planning and regulatory issues is usually a critical part of the developer business case. Obtaining certainty in this area—such as the allowable building density—is important for business planning, as is ensuring that the regulations affecting the real estate project will be commercially viable.

For any real estate project, including one that involves value capture, developers want to know that there is strong market interest. Developers have a variety of ways to assess this, including the quantitative ways listed in the questions in Table 10. Developers also gauge the market through qualitative methods, including extensive and ongoing discussions with tenants, leases, property owners, and other real estate market participants.

The level of financial return—the payback on an investment in a project—varies among developers based on a number of factors. These can include legal structure of the investment, tax treatment, investment horizon, and relationship of the project to other developer investments.

Table 10. Elements of a value capture business case for developers.

Element	Key Questions to Be Addressed
Transit project scope and planned operations	• Does the transit service generate additional value for the land or real estate development? • Does the transit service generate a level of foot traffic that makes the real estate improvement more desirable? • Is the transit service permanent (i.e., a fixed guideway or significant BRT infrastructure investment), and therefore harder for the public to remove or relocate?
Planning and regulation	• Does the project comply with long-range plans? • Are regulatory issues adequately addressed?
Nature of value capture opportunity	• Are TOD alignment opportunities economically compelling? • Do station locations suggest particular opportunities given market conditions? • Do zoning, land use regulations, and design standards (including increased densities and reduced parking requirements) foster TOD?
Interest in market	• How strong is the land and lot availability and pipeline? • Is there sufficient interest from possible tenants? • Is TOD accepted in the market? • Are housing prices and the prevailing rent burden positive for the market? • Are retail and office inventories tightening and absorption rates increasing?
Land ownership in the case of joint development	• Is land publicly or privately owned, and what assemblage is required? • Have the station locations been determined? To what extent will the planning process reveal the station locations, affecting purchase negotiations? • Is there an option for density bonuses or additional uses?
Financial return	• Is the project rate of return for the development expected to meet or exceed the developer's expectations? • Are the expected contributions of debt and equity from the developer (based on the financials of the project) in line with current market expectations?

Source: Adapted from Long, 2011.

5.4 Value Capture and Land Speculation

Stakeholders should be aware of the extent of value capture opportunity that can be lost to speculators and opportunistic investors subsequent to the announcement of prospective projects and prior to implementation. Since most public transportation planning activities include extensive public engagement and disclosure, opportunistic speculators or developers may acquire property or options or negotiate partnerships with landowners in anticipation of future value creation associated with transit development.

The value of property near transit facilities rises over time as the transit project progresses to completion, as shown in Figure 14. The value of property continues to rise after transit project completion as the benefits of the facility are proven and ridership demand increases. The increased property value is expressed through the ability of the market to absorb higher prices, reflecting the value premium associated with transportation improvements.

In the absence of early strategic partnerships, land speculators may realize much of the land-rent premium induced by prospective public investment by the time a transit agency or local government announces a transit project and station locations have been identified. Real property value premiums associated with transit begin to materialize even before transit project development takes place. If transit agencies have committed to station locations prior to securing strategic value capture partners, value premiums may be capitalized into land costs by the time developers become engaged.

Land value capitalization begins as investors and speculators respond to announcement of plans and continues as progress toward project implementation proceeds (Knaap, Ding, and Hopkins, 2001). Such investors/speculators may have no long-term interest in or commitment to the resulting development—in which case, value is lost to the ultimate developer, its customers, and ultimately to the public through the loss of value capture potential.

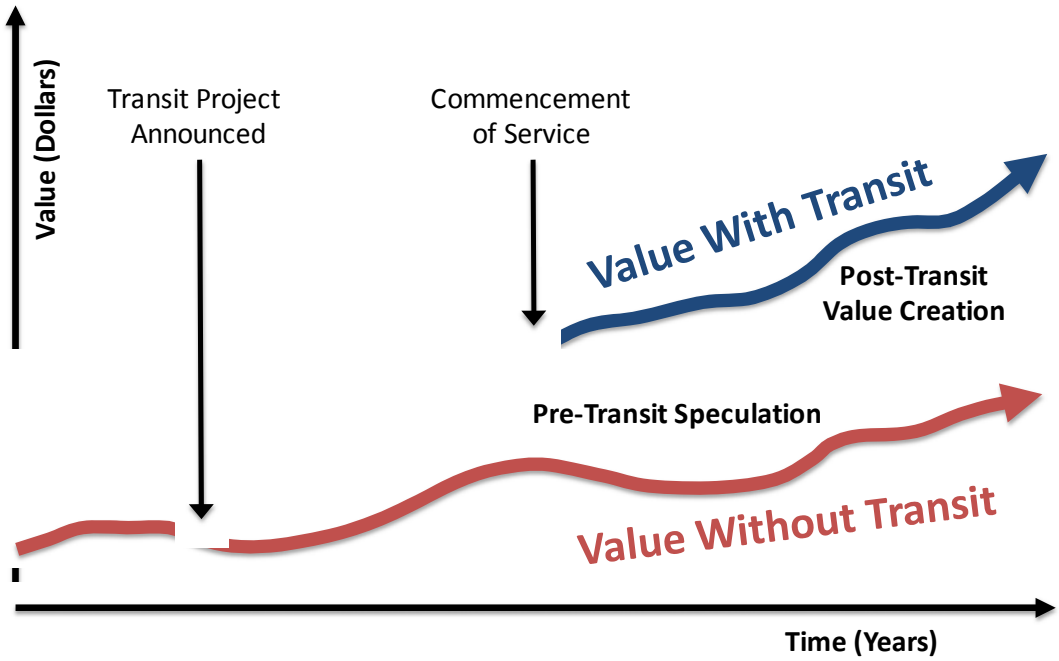


Figure 14. Transit value creation and speculation.

An increase in land acquisition costs resulting from pre-transit speculation is one of the many reasons that transit agencies must partner with developers to maximize the opportunity for value capture. Early strategic partnerships between transit agencies and developers can allow for:

- Highly market-informed consideration of station locations and development potential,
- Land assemblage prior to significant land-rent speculation, and
- Negotiation of mutually beneficial design standards and value capture mechanisms.

Where possible, value capture mechanisms should be structured early in the project development process, prior to the transit agency's commitment to or design of station locations. Early accommodation of value capture strategies provides developers with maximum potential control and design of sites, thereby allowing transit agencies to realize the maximum possible value capture. Transit agencies can jump-start the value creation process not only by participating in early conceptual planning, approving TOD-supportive station-area plans, engaging with the local government, and partnering with the developer, but also by funding predevelopment such as site and infrastructure planning and entitlements.[1]

Maximizing value capture requires that potential value induced by public investment in transit infrastructure not be wasted or go unrealized. This has implications for the enticement of private investment and development and for the local government and other public-entity interests. The greater the extent to which value can be created and captured for public benefit, the more the local government may be able to invest and reinvest in TOD value creation—or even include additional infrastructure amenities that make the deal more attractive for private partners.

The example of the Hong Kong MTRC is unique because the transit agency received developable land from the Hong Kong Special Administrative Region (HKSAR, the local government body) for free or at costs below market value. It subsequently sold those properties to developers as stations and other transit amenities were developed, retaining some shareholding rights, which allowed MTRC to benefit from the appreciation of land values. This unique access to property and HKSAR's unique monopoly on land, in general, explains why MRTC is one of a handful of transit agencies worldwide that covers its costs and is able to share profits with its public and private shareholders (see more in Appendix D).

CHAPTER 6

Creditworthiness, Finance, and Funding

> Creative financing is essential to spreading the risks; expanding the base of knowledge and experience; and tapping into the fiscal advantages of certain partners, such as local governments' superior bond ratings and guarantees, to make projects "pencil out." (Cervero et al., 2004).

Transit agencies and local governments traditionally pay for large transit projects in three ways (as shown in Table 11):

- **Grants** provided by local, regional, state, and federal sources;
- **Pay-as-you-go funds**, corresponding to the cash flow needs of the project, especially if the project can be built in segments; and
- **Financing, primarily through tax-exempt or municipal bonds**, secured by sales taxes, gas taxes, and sometimes fare revenues. In some instances, such as with grant anticipation notes, financing can be secured by grants, such as from the FTA. However, as discussed in the following, it is rare that financing is secured solely by value capture revenues.

It is typical for a major transit project to include all three funding sources—grants, pay as you go, and public financing.

6.1 Funding

For many transit agencies, the major funding sources for capital projects are:

- Sales taxes at the local level;
- Federal grants from the FTA, the FRA, or the FHWA; and
- State grants, often funded with state-level gas tax monies.

Few, if any, transit agencies earn an operating surplus that could be used for funding capital. However, some transit agencies have issued bonds secured by fare-box revenues (with operating costs covered by other sources) or used innovative direct revenues like naming rights to fund certain assets.

As discussed, transit agencies and local governments also contribute to project funding through land contributions, air rights leasing, and, in some instances, by expediting the entitlement approval process (Bernick and Freilich, 1998).

6.2 Tax-Exempt Financing

Typically, transit agencies and local governments are allowed to issue municipal bonds that are exempt from federal taxes and many state and local taxes, depending on the laws of each state. They also may borrow from banks and private placement providers. In order to borrow from these markets or institutions, the credit of the transit agency or local government or the project in

question must usually be "investment grade," a term that refers to the credit rating of the entity or the project. An investment-grade rating is one in which the rating is above the level of "BBB" for Standard & Poor's (S&P)/Fitch Ratings or "Baa" for Moody's, the three major credit rating agencies (S&P, 2016; Moody's, 2016; Fitch Ratings, 2016). Such a rating or higher (e.g., "A," "AA" or "AAA" on the S&P ratings scale) assumes at least "good credit quality. . . . BBB ratings indicate that expectations of default risk are currently low" (Fitch Ratings, 2016).

Table 11. Transit funding sources and financing mechanisms.

	Funding Sources		Financing Mechanisms
	Direct System Revenues	*Other Funding Sources*	
Traditional	• Fare box • Non–fare box o Traditional advertising o Parking	• Local o Sales taxes o Other local taxes (gas, lodging, rental car) o State and federal grants	• Tax-exempt and taxable bonds • Bank debt
Innovative	• Station related o Concessions o Parking innovations o Innovative advertising • Right-of-way sharing	• Value capture related o Joint development o Special assessment district o Tax increment finance o Impact fees/negotiated exactions o Parking fees o Naming rights • Tolls from partner agencies	• Innovative finance o TIFIA o RRIF o State infra. bank o Tax credit loans • Via a P_3 delivery mechanism o Private activity bonds o Availability payments o Private equity

Note: TIFIA = Transportation Infrastructure Finance and Innovation Act.

Many retail bond funds primarily purchase bonds that are rated investment grade or higher. Since these bond funds dominate the tax-exempt market, a bond without an investment rating will be purchased by fewer investors, if any. Therefore, most transit agencies and local governments strive to issue investment-grade bonds. Most bonds for transit issuers and projects tend to be rated "A," defined as "expectations of low default risk" (Fitch Ratings, 2016). As discussed, these bonds or debt instruments are often secured by sales taxes, such as the Denver Union Station Project Authority senior lien notes, rated "A" based on a combination of several grants and tax sources (Fitch Ratings, 2015a).

While banks and private placement providers, such as insurance companies, are usually not required to follow this investment-grade/non–investment-grade system, they often view

investments in a similar way. These providers are somewhat more willing to consider non–investment-grade credits in return for higher yields.

When transit agencies or local governments issue bonds or obtain loans for projects dependent on real estate revenues, these instruments are often backed by another creditworthy source, such as sales tax or the credit of the local government, known as a "double-barrel" or "backstop." For example, in the Denver Union Station case, the Transportation Infrastructure Finance and Innovation Act (TIFIA) loan was secured by the RTD's sales tax pledge. The subordinate RRIF loan was secured by TIF and special assessment district revenues and the appropriation guarantee of up to $8 million from the City and County of Denver to cover a portion of the $12 million annual RRIF debt service (Denver Union Station Project Authority, 2011).

Because real estate markets are highly cyclical and the markets' absorption of new real estate projects can be fickle—especially when the developments are somewhat innovative or are higher priced than comparable real estate—credit rating agencies have traditionally been cautious about assigning an investment-grade rating to infrastructure projects dependent on new real estate–related revenues such as TIF bonds. The business cycle poses a key risk consideration for developers and, in some instances, transit agencies and local governments. Credit rating agencies feel more comfortable assigning investment-grade ratings to projects that are supported by existing revenue, such as the financing associated with the Dulles Metrorail special assessment district in the Washington, D.C., area (see Appendix G).

For example, the City of New York helped to finance the 7th Avenue Rail Extension project using a structure based on the tax increment revenues from the Hudson Yards development project. The City of New York pledged to cover the interest costs for the life of the bonds if revenues proved to be insufficient and with its obligation being absolute and unconditional, subject to appropriation. Moody's assigned an "A2" credit rating, which is three notches lower than the city's general obligation rating of "Aa2," reflecting the need for annual appropriation of the city's interest subsidy, the nature of the project being financed, and volatility in New York City's real estate markets that could delay development in the Hudson Yards area (Moody's Investor Service, 2011).

Knowledge of the criteria applied to the rating of debt issued by or on behalf of U.S. state and local governments is useful for understanding how ratings agencies view state and local debt. Fitch Ratings outlines five key drivers of their state and local ratings (Fitch Ratings 2016):

1. **Overall sector risk:** The starting point for analysis of U.S. state and local issuers is the recognition that all operations are within the United States.
2. **Foundational economic analysis:** Issuer-specific analysis begins with consideration of the performance, trends, and prospects for the economic base—this could apply to states, local governments, transit agencies, and so forth.
3. **Four key factors:** Fitch identified four key ratings factors that play a significant role in driving the rating outcome for a given issuer in the context of its economic base—revenue framework, expenditure framework, long-term liability burden, and operating performance.
4. **Performance through economic cycles:** Fitch creates scenarios that take into consideration how a government's revenues may be affected in a cyclical downturn and the options available to address the resulting budget gap.
5. **Strength of the pledge:** The ultimate bond rating reflects the strength of the pledge. Ratings are assigned to specific securities based on their legal provisions and relationships to/separation from the general credit quality of the related government. This is expressed through an issuer default rating.

6.3 Innovative Finance

Some federal and state programs can be advantageous for value capture financing, including:

- The TIFIA loan program administered by the U.S. DOT's Build America Bureau;
- The RRIF program, administered by the U.S. DOT's Build America Bureau; and
- State infrastructure banks, which are managed by many state governments.

While each program has its own lending criteria, common to TIFIA and RRIF are their attractive terms, including:

- **Below-market interest rates**, usually reflecting the cost of borrowing to the federal government or the state; and
- **Below-market repayment terms** allowing for longer periods of interest capitalization, more flexibility and greater back loading of repayments, and longer duration. As shown in Figure 15, the TIFIA principal is paid back after senior debt service and corresponding to the shape of the net cash-flow line.

For some projects where the early year ramp-up or real estate absorption is uncertain, these instruments can provide cash-flow relief.

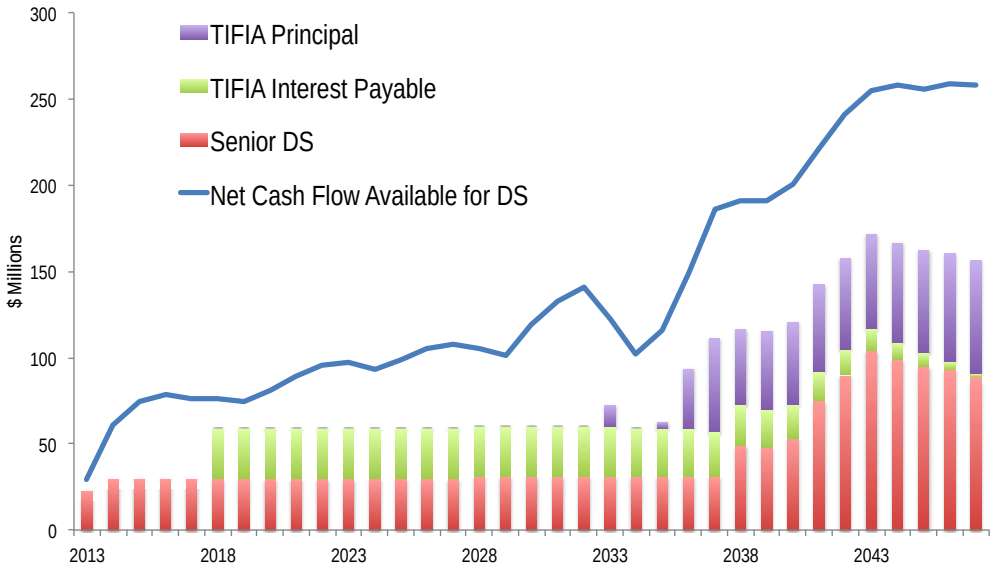


Figure 15. Illustration of typical TIFIA loan cash-flow features.

The TIFIA program requires that if a borrower is financing a project with the same revenue pledged to secure both senior debt[2] (such as a tax-exempt bond) and a subordinate TIFIA loan, then the senior debt must be investment grade. Due to TIFIA's "springing lien" structure, which forces TIFIA to "spring" to the senior position following two bankruptcy-related events, credit rating agencies rate both senior and TIFIA debt at the same priority position, and therefore both debt instruments must be investment grade. While value capture financing can take advantage of features within TIFIA to accommodate uncertain cash flow resulting from the vagaries of real estate markets, its utility is limited by requirements that such cash flows be highly reliable or subject to a backstop.

Where financing is dependent on TIF, joint development, or impact fee revenues related to new development, a backstop or other mitigation of real estate market risk may be required. As discussed, sales taxes provided such a backstop for Denver Union Station's senior debt, and the City and County of Denver helped support the subordinate debt to realize the transaction. More information about how this mechanism worked, and the stacking of TIFIA and RRIF, can be found in the Denver Union Station case study in Appendix B.

Special assessments imposed against real estate assets with a track record of producing similar assessment revenues may not require an additional backstop. As more TOD projects are developed and credit markets become more comfortable with them, lenders may accept more real estate–based risk. Impact fees and negotiated exactions have been financed with private placements or nonrated bonds, sometimes using the land as collateral (primarily for large master-planned residential projects). For instance, in 2015 the developer of a Dallas-area real estate development closed a $16.8 million nonrated bond to fund road and other improvements secured by property and funded by assessments (City of Celina, 2015).

6.4 FAST Act TOD Provisions for TIFIA, RRIF, and FTA TOD Pilot Planning Grant Program

The 2015 FAST Act included substantive and procedural changes to the TIFIA and RRIF programs. The U.S. DOT's Build America Bureau is responsible for streamlining credit opportunities and grants for transportation infrastructure development projects in the United States. As such, the bureau serves as a single point of contact for all programs and tools, including TIFIA, RRIF, and private activity bonds.[3]

Additionally, the FAST Act expands TIFIA's and RRIF's ability to support TOD projects, potentially enhancing value capture projects. It also extends the TOD Pilot Planning Grant program. The FAST Act expands TIFIA eligibility to include TOD-specific and local infrastructure projects. Subject projects can include parking garages, property acquisition, and bike/pedestrian infrastructure. In addition, the FAST Act lowers the TIFIA project cost requirement for TOD and local infrastructure from $50 million to $10 million—making smaller projects eligible. This is particularly useful for smaller cities, which typically have smaller-scale, lower-cost projects. The FAST Act also reduces application costs for low-cost, low-risk projects, including $2 million in annual grants to help defray these costs for smaller projects (Smart Growth America, 2015).

The FAST Act extends the range of RRIF-eligible infrastructure as follows:

> (Sec 11604) (E) finance economic development, including commercial and residential development, and related infrastructure and activities, that—
>
> (i) incorporates private investment;
>
> (ii) is physically or functionally related to a passenger rail station or multimodal station that includes rail service;
>
> (iii) has a high probability of the applicant commencing the contracting process for construction not later than 90 days after the date on which the direct loan or loan guarantee is obligated for the project under this title; and

> (iv) has a high probability of reducing the need for financial assistance under any other Federal program for the relevant passenger rail station or service by increasing ridership, tenant lease payments, or other activities that generate revenue exceeding costs (United States Government Printing office, 2015).

The FAST Act also extends the TOD Pilot Planning Grant program, which supports planning around new transit investments and includes efforts to create or preserve affordable housing. As of 2016, the pilot program has funded $19.5 million in TOD project plans, ranging from streetcar projects to station-area TOD plans to bus rapid transit station planning (FTA, 2015).

Creation or preservation of affordable housing near TOD, as the FAST Act's TOD Pilot Planning Grant program supports, is a public policy objective that can be both hindered through the value created by public transit and helped if value capture is applied to address affordable housing needs. The very value creation that can be induced through infrastructure investment can exacerbate already substantial economic challenges related to affordable housing. The fundamental problem of workforce and affordable housing is that the cost and market value of high-quality housing in appropriate locations exceed the ability of tenant/owners/occupants of that housing to pay for it without an undue and inappropriately high (rent) burden. The value capture opportunities addressed in this guide exist because investment in transportation infrastructure can induce value creation in the marketplace. The nature of such value creation elevates market values and raises housing costs. As such, communities that desire to preserve or create affordable housing opportunities near transit need to make use of public policy tools such as inclusionary zoning, tax credits, streamlined reviews or permitting, and federal tools such as the FTA's TOD Pilot Planning Grant program.

Some value capture mechanisms have been used to directly address affordable housing. For example, the Transbay Redevelopment Plan associated with the San Francisco Transbay Terminal project specifically outlines creation of affordable housing as part of its objectives. The Transbay project is partially funded through a tax increment. A portion of the tax increment is allocated to pay capital costs for the Transbay Terminal, while the rest is used to address other needs, including affordable housing. Specifically, $126 million of the total tax increment will fund affordable housing activities within the Transbay Redevelopment Project Area (San Francisco Office of Community Investment and Infrastructure, 2016).[4]

6.5 Public–Private Partnership Financing

Developers can directly finance a transit project through a P3 project delivery structure. In a P3 delivery structure, private developers enter into a long-term concession agreement that allows them to design, build, finance, operate, and maintain the facility. In return for receiving payments from the public project sponsor or revenues associated with the project, developers finance some or all of the capital investment using a combination of debt, including senior private activity bonds (a form of tax-exempt financing authorized by the U.S. DOT and TIFIA loans) and equity.

The P3 approach has been used for several transit projects, including the Denver Eagle P3, a commuter rail facility connecting Denver Union Station with Denver International Airport. Within transit projects, the P3 developer typically receives availability payments as its revenue source. Availability payments are payments made to a P3 developer by a public project sponsor (e.g., a state DOT or transit agency) based on project milestones or facility performance standards in exchange for particular services. Availability payment–based P3 structures are typically used for transit projects due to the fact that typical revenue streams associated with transit projects, such as fare-box, advertising, and station concessions, are not attractive enough to offset the high

capital costs associated with designing, building, financing, operating, and maintaining transit facilities.[5]

Formal P3 structures have not typically been employed for the real estate development portion of value capture projects. In the case of Denver Union Station, a developer served as the master developer but was not the entity responsible for station and infrastructure construction loans. Rather, the developer was focused on the development of adjacent residential and commercial property.

One exception is All Aboard Florida, the developer of MiamiCentral, the Miami terminus of a private intercity rail line between Miami and Orlando. All Aboard Florida will develop both the stations and the real estate along the line. An important fact is that All Aboard Florida is a subsidiary of Florida East Coast Industries, which has been the owner of most of the rail lines and adjacent property for over a century, using it primarily in the last decades for rail freight (All Aboard Florida, 2016).

A developer could conceivably enter into a P3 with a transit agency or local government to finance a transit project that would be supported by value capture revenues, providing equity or corporate credit to serve as the financing backstop. The Bechtel Corporation was engaged in a version of that arrangement when it built the extension of the Portland streetcar to the Portland International Airport in exchange for nearby airport land that could be developed for commercial purposes as partial compensation (TriMet, 2016).

CHAPTER 7

Institutional Capacity and Partnership

Successful value capture is dependent on value creation and realization. Neither transit development value creation nor value capture materialize spontaneously. Effective institutional design and cooperative value enhancing and value capture strategies are required for implementing successful projects (Alexander, 2012). Optimization of value capture and transit project viability requires agencies to engage early in partnerships with developers and local governments and to participate strategically in the process of real estate value creation. Early partnership is necessary, appropriate, and critical for success.

Figure 16 identifies the partnerships between institutional parties, including transit agency, local government, and developer, that are important to successful value capture projects. Other stakeholders, such as additional public-sector entities, land owners, and other private-sector entities, can play important roles as well. For example, the regional metropolitan planning organization played a central role in organizing the development effort for the Denver Union Station project. Multiple developers and business groups played determinative roles in realizing the value capture–funded Dulles Metrorail project (see Appendix G).

Figure 16 demonstrates that public and private stakeholders are constrained to some degree by characteristics and conditions of the overlapping financial markets in which they operate. Specific elements of a large TOD project might be financed with either public or private debt instruments, or both. Rail and bus infrastructure within the Denver Union Station project was financed with TIFIA and RRIF, public financing vehicles available to both public and private entities. Real estate parcels comprising the Denver Union Station project were sold to developers and financed privately in conjunction with TIF and special assessments (see Appendix C).

New transit infrastructure can meet both public and private needs. For example, structured parking may serve both private development and transit users, regardless of financing. Dulles Metrorail's 2,300-space public parking garage on Wiehle Avenue was financed with tax-exempt bonds secured by contract payments from Fairfax County subject to annual appropriations. Fairfax County expected that revenues generated by the 99-year lease with a developer for commercial development above the garage would cover these contract payments. Financing of the private garage, in the same structure as the public parking but physically segregated from it, was secured by Comstock, the developer responsible for the 1.5 million ft^2 mixed-use development known as Reston Station. This project will include retail space, a restaurant, luxury apartments, and offices. The private garage offers daily parking rates similar to those in the public garage but provides different packages for reserve spaces (Fairfax County, 2015).

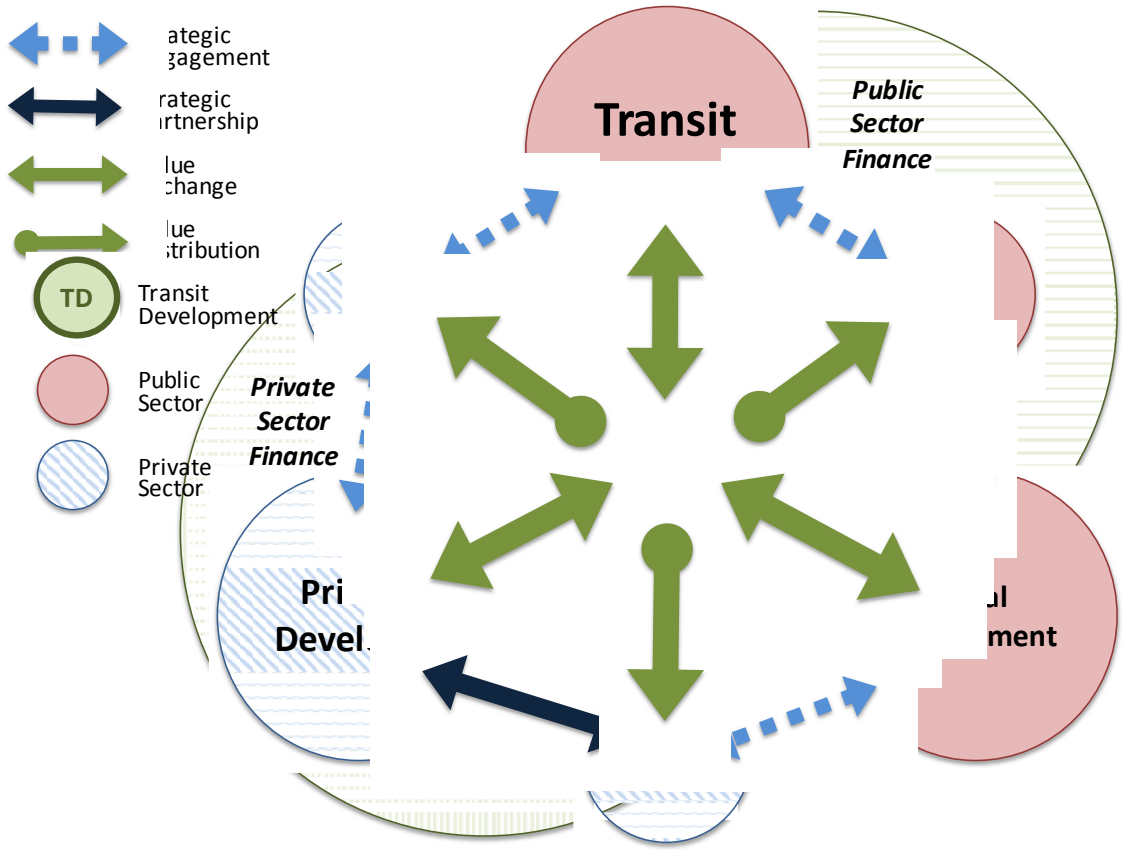


Figure 16. Institutional engagement and partnerships for transit-induced value creation and value capture.

7.1 Overcoming Development Complexity and Risk

In many settings, extensive coordination between the transit agency, local government, developer, and other public and private interests will be required to maximize development and value capture opportunities. Transit agencies are effectively completely committed at the outset of a transit infrastructure project. Developers, on the other hand, often invest in real estate near transit incrementally and over long periods of time. Developers constantly monitor the changing market, economic, and financial conditions to evaluate and underwrite new investments.

Reflective of this relatively high-risk enterprise, investors and developers demand steep discounts for underwriting uncertainty, risk, and complexity. Developers must be enticed to take a long-term view of value creation and management of the unusually complex risk associated with developments such as TOD. Partnerships between the transit agency, developers, and local government can be employed to reduce uncertainty and risk.

The literature addressing integration of transit, land use planning, and value capture urges:

- Early development of substantive dialogue between public entities and the public and private sectors (Vadali, 2014). This was confirmed through the Portland streetcar project as early engagement was seen as an important factor in that project's success.
- Development of coherent value creation and value capture strategies between partners sharing common goals requiring the exchange of information.
- Overcoming silos of professional practice that limit the sharing of knowledge and overcoming differences in culture, perspective, and institutional norms.

The complex and multiparty nature of TOD projects requires extensive engagement and partnership between various public and private stakeholders (Hale, 2008; TCRP, 2004). The interconnectedness and potential mutuality of interest between public and private interests require partnerships that span planning, design, organizational, management, and financial considerations (Dittmar and Ohland, 2004).

7.2 Fostering an Ethos of Cooperation

Regardless of how enticing any particular project appears at the outset, many are subject to obstacles that cannot be controlled or overcome by the developer alone. Many factors that contribute to TOD success are under the purview of transit agencies and local governments. For example, the transit agency or local government may be in the best position to negotiate TOD-favorable terms and standards with fire marshals, transportation engineers, municipal planners, and zoning administrators.

Articulating the value capture opportunity and solidifying public support are other important components benefitting from transit agency/local government cooperation. Local governments are rich in experience in engaging neighborhoods and communities and facilitating public meetings, outreach, and education. Public support for projects is necessary for many reasons, not the least of which is securing legislative, regulatory, and financial support from policy makers. The need for cooperative effort may be particularly great between local, regional, state and even federal governments.

7.3 Institutional Capacity

> The major institutional barriers to TOD are regulatory ones, either a product of restrictive state statutes or self-imposed transit-agency rules. Some states limit, ipso facto, real-estate transactions undertaken by transit agencies to "transportation uses." Many transit properties shy away from land development matters on the grounds that it is not central to their mission of delivering safe and efficient transit services. As a result, most agencies have no personnel assigned to TOD or, more generally, land development, leaving it to their legal departments to handle land-use affairs and disputes (TCRP, 2004).

Another challenge in effecting successful value capture projects is the lack of institutional capacity to manage these efforts, especially on the part of the transit agency. Employing staff devoted to fostering value capture or developing real estate can only be justified by the largest transit agencies. Often these property management staff have other duties, including managing non-transit assets, disposing of unused property, and leasing retail space in major stations. Smaller transit agencies are not engaged in building major new facilities on a frequent basis, so it is difficult to justify hiring specialized staffing for this function.

The solution for many transit agencies is to engage consultants for specified tasks or projects. Even the Massachusetts Bay Area Transit Authority outsourced its real estate functions to a private firm (Moynihan et al., 2016). The FTA is helping to fund some of this consultant work through its Pilot Program for Transit-Oriented Development (TOD) Planning (FTA, 2014b).

APPENDIX A

Considerations Checklist

Throughout the course of this research, the research team found that coordination among diverse stakeholders early in the project planning process yielded positive results. Additionally, early legwork setting the stage for value capture through legislation and rulemaking was essential in ensuring that projects could readily access value capture tools when needed. Following is a step-by-step list of considerations, grouped into categories and in order of being most useful to transit agencies, developers, and other stakeholders, for understanding how to undertake transit value capture. This step-by-step list assumes that various value capture mechanisms are allowable under local and state laws and that a transportation mode has been selected for the project.

Step 1: Understand what is possible	• Engage legal counsel to make a list of all possible value capture mechanisms that can be used for the project. • Review Table 3, major value capture mechanisms, for a list of value capture options deployed in the United States. • Explore strategic land parcels near the project area that may be used for joint development and other mechanisms. Pay particular attention to parcels that are owned by the local government or another public entity. • Identify possible stakeholders and partners (public, private, and institutional) that could serve as a starting point for strategic partnerships and investments.
Step 2: Select promising mechanisms for further exploration	• Review Table 5, value capture mechanisms by station type, to help identify value capture mechanisms that may be most appropriate for the project. • Consider existing land uses, density, demographics, and other economic considerations when selecting mechanisms. • If applicable, use the needs of the project as selection criteria for the value capture mechanisms. For example, if up-front capital costs are needed, then a financing option that offers a large infusion of funds up front is more appropriate. If operations and maintenance funds are needed, then an assessment that provides long-term, dedicated funding streams may be more applicable.

Step 3: Evaluate promising mechanisms to ascertain value capture potential	• Coordinate with public agencies such as the area's metropolitan planning organization, planning departments, redevelopment agencies, transit agencies, and departments of assessment and taxation, to gather needed data and initiate conversations. • Establish appropriate criteria and assumptions for estimating and evaluating value capture mechanisms. Include assumptions for growth, inflation, catchment areas, assessment levels, and so forth. • Evaluate promising mechanisms to get a back-of-the-envelope estimate.
Step 4: Decide on the most appropriate mechanism(s) that will further the project	• Create selection criteria for the value capture mechanisms based on feasibility, appropriateness of the revenue generated in relation to project needs, stakeholder support, and so forth. • Include major stakeholders in discussions and up-front coordination. • For large, complex projects, consider establishing a task force to help with decision making and providing recommendations.
Step 5: Engage with wide array of stakeholders and the public	• Engage wider array of stakeholders and the public, and include ample time for this process and workshops, as needed.
Step 6: Initiate and establish value capture mechanism(s)	• All tasks in this step are dependent on the specifics of the project and what is needed to utilize the selected value capture mechanism.

APPENDIX B

Boston Landing Station, Boston, MA

I Overview

The Brighton neighborhood in northwest Boston is the site of the 15.48-acre Boston Landing development. Boston Landing is a mixed-use development adjacent to the existing New Balance world headquarters building. The site is a former industrial area that once served as the region's largest stockyard and is located along the Massachusetts Turnpike. The site is being developed by NB Development Group, a subsidiary of New Balance and HYM Investment Group, LLC (Rocheleau, 2014).

The project's anchor tenant, New Balance, already occupies a new 250,000 ft^2 world-headquarters building on the site and has moved about 700 employees to the new building as of September 2015 (Geller, 2015). The rest of the project includes (see Figure 17):

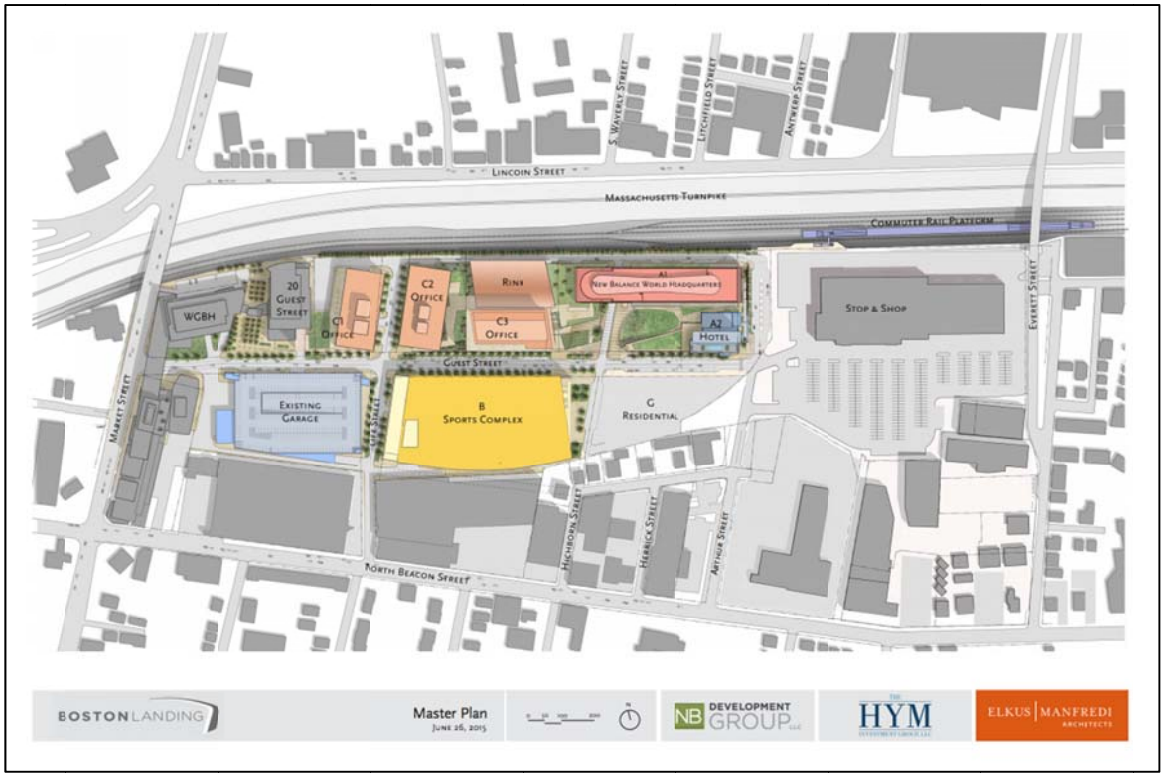
- A 650,000 ft^2, build-to-suit, class A office space certified by LEED (Leadership in Energy and Environmental Design);
- A 140,000 ft^2, 175-key boutique hotel;
- 65,000 ft^2 of ground floor restaurant and retail space;
- A 325,000 ft^2 state-of-the-art sports complex;
- 275 residential units;
- A commuter rail train stop on the Framingham/Worcester line that goes directly to Boston's South Station; and
- Public amenity space, usable open space, and pedestrian linkages.

The estimated $500 million Boston Landing project includes a $25 million commuter rail stop that is primarily funded and built by New Balance. An additional $8 million of track and signal work will be funded by the MBTA. The station will be on the MBTA's east-west Framingham/Worcester Line. NB Development Group has also agreed to pay for maintenance costs for at least the first decade after the station opens (Semuels, 2015). This project utilizes two value capture mechanisms: negotiated exaction and naming rights.

II Regulatory

II.A Boston Landing Parking Needs

NB Development Group bought the property for its new headquarters and other developments in 2009 and 2010. The intention was to move employees from its former headquarters nearby, consolidate other regional offices, and develop property for third parties. An additional objective was to create a center of sports entertainment and health and wellness with training facilities for two of New England's major sports franchises, the Boston Bruins hockey team and the Boston Celtics basketball team (as discussed later in this appendix).



Source: Boston Redevelopment Authority, 2015.

Figure 17. Boston Landing master plan.

NB Development Group realized that it could not obtain approvals for the amount of parking needed given the expected size of the full build out. Furthermore, it felt that it would be too expensive to build the required structured parking (Personal communication, 2016). Therefore, the commuter rail station was an important element in realizing the entire project.

II.B Station Planning and Development

The station has been subject to various transportation planning and long-term planning studies. In 2009, the Massachusetts Department of Transportation (MassDOT) identified the location as one of two preferred locations for a new commuter rail station in the area as part of the legislatively mandated Allston Multi-Modal Station Study (MassDOT, 2012). Until the 1960s, there were three stations in the area on the same line that is now MBTA's commuter line from South Station in downtown Boston to Worcester. The new commuter rail station was proposed as part of the Boston Redevelopment Authority's Brighton Guest Street Planning Study of 2012. The study stated that to support the first 500,000 to 700,000 ft^2 of development in the area, new transportation infrastructure would be required (Boston Redevelopment Authority, 2012). The financial position of the MBTA, however, was such that a new station for the Brighton neighborhood was deemed unlikely (Semuels, 2015).

The station has been designed according to all MassDOT and MBTA station requirements and constructed using a management plan approved by MassDOT and other relevant federal, state, and local agencies (MassDOT, 2012).

III Market Considerations

NB Development had four considerations in developing Boston Landing and funding most of the Boston Landing Station:

- To have more space to allow for expansion of New Balance as it grew and allow for consolidation of other offices, providing the current workforce, which primarily commutes by car, with a transportation alternative;
- To attract a more youthful workforce that prefers to work in locations that are accessible to transit, bike, and pedestrian facilities;
- To associate the New Balance brand with leading New England and national sports teams; and
- To provide attractive transportation alternatives for the office, retail, and residential developments, offer an attractive environment for a younger workforce (as for the New Balance headquarters), and associate the location as a sports entertainment center.

The ice rink will be leased out to the Boston Bruins at certain times, with the Bruins expected to allow the general public to watch their practices. At other times, NB Development Group will make the rink available to other sports groups and the general public. New Balance's Warrior Hockey brand will benefit from naming rights for the facility (Switaj, 2016).

New Balance opened its new headquarters in 2015. Boston Landing Station is projected to be finished by 2017. The other elements of the project—sports facilities, offices, residential, retail—are expected to open by 2018 (Geller, 2015).

Because the real estate project (as depicted in Figure 18) is not fully built out, it is too early to determine whether NB Development Group has received an adequate return on investment for the new station. Because of brand benefits from the entire real estate development, it may be difficult to ever separate the impact of the station from the business case for the development. The Boston Landing Station, and possibly the entire development, benefits from being primarily owned by Jim Davis, the CEO of New Balance Athletics and the primary owner of NB Development Group; a longer-term view can likely be taken since both companies are privately held.

IV Coordination, and Partnership

In 2012, NB Development Group signed a letter of intent with the former Secretary of Transportation to largely fund the station with its own monies, to turn it over to the MBTA on completion, and to make payments for station maintenance for the subsequent 10 years. The maintenance agreement also gives NB Development Group station naming rights during that period.

While NB Development Group was responsible for all design and construction of the station, it was required to follow all state and federal construction standards. This required close coordination with the MBTA, Massachusetts Department of Transportation, Keolis (the operator of the commuter line under contract with MBTA), and the active users of the adjacent tracks, including Amtrak and CSX.

Source: Rocheleau, 2014.
Figure 18. Boston Landing rendering.

The station construction presents challenges due to:

- A physically constrained site and the need to maintain commuter rail and freight operations,
- Required coordination with multiple other projects on the Worcester line in order to minimize impact on rail service, and
- The MassDOT Highway Division's work on the Everett Street bridge and electronic tolling on the Mass Pike (MBTA, 2016).

V Business Case and Financing

The Boston Landing Station is largely funded with NB Development Group monies, with an estimated $25.3 million covering the vertical construction and $0.8 million of that amount provided by MassDOT. Furthermore, MassDOT agreed to provide $8.3 million in horizontal station signal work and associated track/signal work for the Worcester line.

NB Development Group will also be providing $470,000 for maintenance ($47,000 per year for 10 years) after station completion.

The involvement of MassDOT in funding some of this work reflects that (1) some track improvements are to the entire line and not just the station and (2) NB Development's expertise is in managing structures and not heavy rail infrastructure (Personal communication, 2016).

Since NB Development Group procured the contracts, it did not need to follow state or federal rules, such as "Buy America" requirements, which typically require major components of transit facilities, such as steel, to be bought from a U.S. manufacturer. Because of this, NB Development Group would not be eligible to receive any federal funding for the project, were any to be available.

NB Development may receive some financing assistance from the Commonwealth of Massachusetts' I-Cubed program (Massachusetts Executive Office of Administration and Finance, 2016). This program provides financing for economic development projects. The financing is to be repaid by property assessments from the projects, with support from the respective municipality. It has partially financed another infill transit station project, the Assembly Square Orange Line station, in Somerville, MA. That project was led by state agencies, including the MBTA and the City of Somerville, but also received a contribution from the major developer (City of Somerville, 2016).

VI Takeaways

There are several takeaways for others contemplating similar value capture projects:

- **Private Financing to Support Public Need:** Building a new commuter rail station in the vicinity of Boston Landing had recently been contemplated by planners, but funding was not available given the MBTA's other, more urgent state-of-good-repair needs. That a developer would help fund a transit station is not unique and in fact occurred with another Boston-area project, the Assembly Square project several years earlier. What is unique is that NB Development Group is funding all of the vertical elements of the project, making up more than two-thirds of the cost. Benefits from station development were determined to be closely aligned with the public policy objective of providing alternative transportation access.
- **Long-Term Benefit and TOD Premium:** The developer's investment in the station will yield benefits over time, potentially many years, until the project has been fully built out and is a well-established business, hospitality, retail, residential, and sports entertainment destination. The harder-to-estimate return on the real estate development could be characterized as the TOD premium (discussed earlier in the guide). The value of the transit component is complicated by the fact that New Balance seeks to portray itself as a leading-edge, youthful firm associated with national sports teams and health and wellness. Some of the value of the station accrues to the New Balance brand and not necessarily to an easily calculated real estate bottom line.
- **Private Infrastructure Procurement Advantages and Disadvantages:** Unlike most value capture projects in which the developer contributes to a transit agency's effort to build a station or transit line, NB Development Group is responsible for delivering most of the transit infrastructure, through a form of public–private partnership. As a privately constructed project, the decision not to follow federal rules has advantages possibly in cost and very likely in schedule. The disadvantage is that the project cannot access federal fund were this to be needed.

APPENDIX C

Denver Union Station, Denver, CO

I Overview and Description

The Denver RTD, created in 1969, incorporates parts of eight counties and 2,377 square miles, serving a population of 2.7 million, about 55% of the total population of Colorado. The RTD is governed by a 15-member board of directors. The RTD system includes 35 miles of light rail serving 37 stations, 621 RTD-owned buses and 439 buses leased to private operators, park-and-ride facilities, and a number of special services such as shuttles and paratransit.

In order to better serve its growing population, in 2004 RTD embarked on a major service expansion, called FasTracks. The FasTracks plan called for 122 miles of new light rail and commuter rail, 18 miles of BRT, 31 new park-and-ride facilities with over 21,000 new spaces, an enhanced bus network with transit hubs, and the redevelopment of the historic Denver Union Station (DUS). Due to declining sales taxes, the FasTracks program was scaled back from $7.9 billion in 2008 to $6.9 billion in 2013. Funding for RTD included a 1.0% sales tax, of which 0.4% was approved in 2004 to finance the FasTracks transit improvement program.

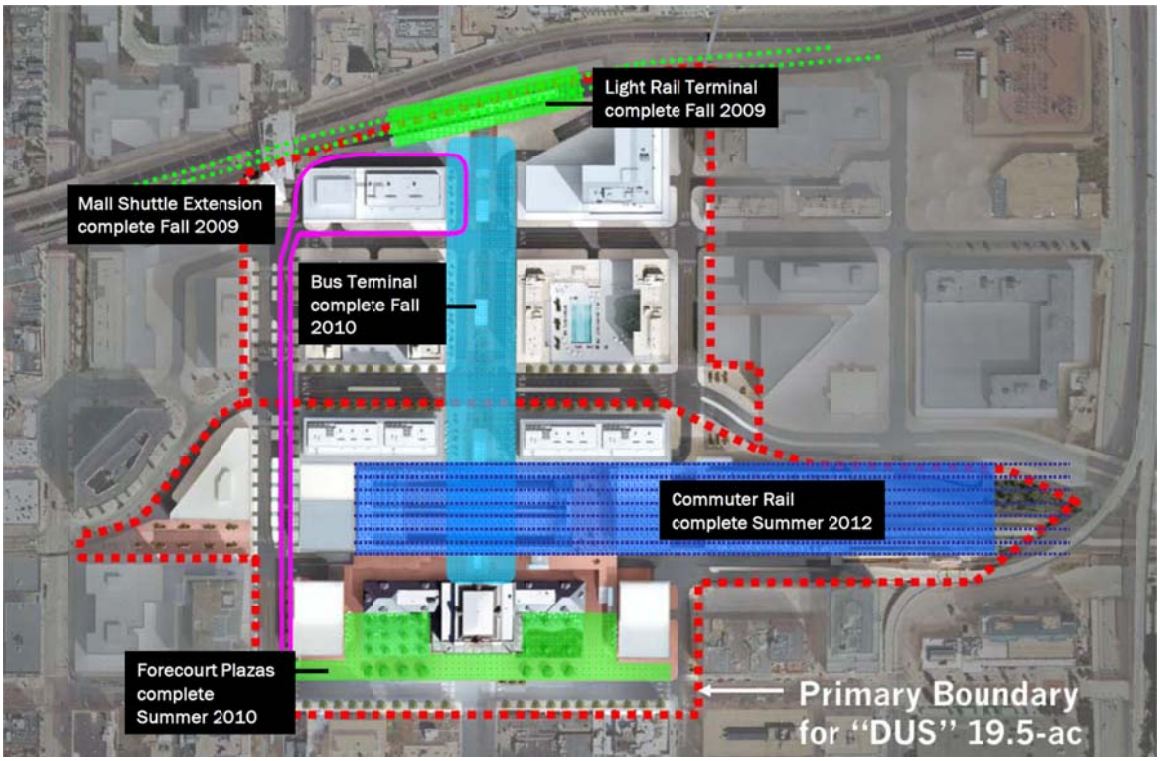
II Project Overview

Built in 1881 and remodeled in 1914, historic DUS was well located to serve as a regional transportation hub, yet by the 1990s only two daily Amtrak trains used the station. The City and County of Denver (CCD) sought to redevelop the site to better serve the needs of the community. Project goals included historic preservation and sustainable development as well as support of transportation.

RTD acquired the 19.5-acre station site in 2001 and cooperated with the Colorado DOT, the Denver Regional Council of Governments (DRCOG), and the CCD to implement a master plan to redevelop the station into a multimodal transportation facility bringing together light rail, commuter rail, intercity rail, bus, parking, taxi, pedestrians, and bicycles. The vision for the station was that of a mixed-use TOD that would become a hub of urban activity including office, retail, and residential uses.

Figure 19 identifies major DUS elements including the station building, commuter rail facilities, bus terminal, and light rail terminal.

The plan's public elements, expected to cost $488 million, included accommodation of various transportation modes and multiple capital investments in buildings, rail and bus facilities, and public spaces (as shown in Table 12).



Source: Denver Union Station Project Authority, 2011.
Figure 19. Major DUS transit elements.

Table 12. DUS project cost by element.

Element	Cost (millions)
Light rail	$56.9
Passenger rail	$145.2
Regional bus	$219.0
Streets and public spaces	$40.0
DUS renovation	$17.0
Miscellaneous	$9.9
Total	$488.0

Source: Barrett, 2014.

III Capacity, Organization, Coordination, and Partnership

Development of DUS was carried out through partnership between four public entities and a developer, as identified in Table 13.

Table 13. DUS project partners.

Partner	Role
Regional Transportation District	Transit agency
City and County of Denver	Local government
Denver Regional Council of Governments	Metropolitan planning organization/ other public entity
Colorado Department of Transportation	State DOT/other public entity
Continuum/East-West Development Partners (now called Union Station Neighborhood Company or USNC)	Developer

Source: Barrett, 2014.

IV Regulatory Considerations

IV.A Master Planning, Zoning, and Environmental Impact Statement

RTD conducted a 2-year master planning process that included public participation and outreach and engaged a 60-member technical advisory committee and the 96-member Union Station Advisory Committee (USAC), representing the interests of 36 stakeholder groups. The effort resulted in a master plan, a strategic vision for DUS, entitlements for the DUS historic station building, and creation of a landmark preservation district. The plan was endorsed by each of the partner agencies as well as the USAC in 2004 (Barrett, 2014).

A key element of the plan was that major transportation infrastructure would be located below ground with the major real estate developments above ground. Unfortunately, based on the high-level planning that had occurred, true infrastructure costs of these plans were not fully estimated, and the plan had many technical challenges, including the Amtrak and FTA determination that all rail had to be at grade. When the plan was finally priced, it was estimated to cost more than $1 billion, much more than the $200 million that was originally anticipated.

The CCD formally rezoned property in 2004 as a transit mixed district in order to accommodate mixed-use TOD (Barrett, 2014). The environmental impact statement (EIS) record of decision was issued in October 2008, clearing the way for the redevelopment of DUS to proceed.

As shown in Table 14, the timeline for project completion—from initial purchase of the site to the end of construction— took more than a decade. Development of the private property around the station is still ongoing.

Table 14. DUS timeline.

Project Stage	Date
Purchase of site	2001
Master planning process	2004
Rezoning	2004
Selection of master developer	2006
EIS record of decision	2008

Construction completion	2014

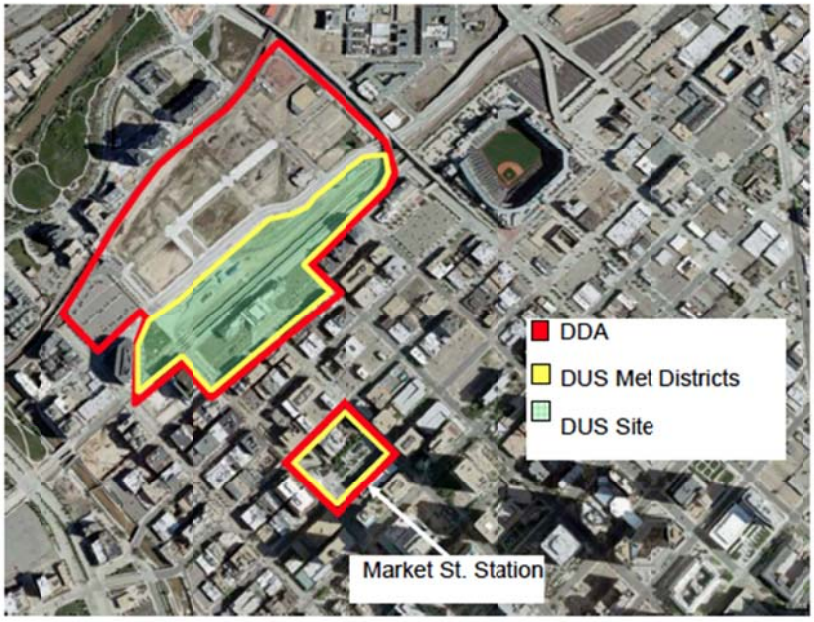
IV.B Legal Steps

DUS partners undertook a number of structural legal initiatives to make DUS a reality. These included measures to provide access to funding sources—TIF and special assessment districts—as well as innovative finance programs. Regulatory and institutional initiatives undertaken by DUS partners included:

- **Intergovernmental Agreement:** The intergovernmental agreement (IGA) was originally intended to memorialize the contributions of each of the four public partners to the purchase of the historic building and site and to acknowledge RTD as the property's fee owner, managed through an executive oversight committee. This was not a legal entity, and it did not have the power to contract. Eventually the group established a legal authority, the Denver Union Station Project Authority (DUSPA) (Barrett, 2014).
- **DUSPA:** DUSPA was created as a 57-187 "on behalf of" issuer for federal tax purposes (to issue tax-exempt debt) and a Colorado not-for-profit corporation that provided the initial legal entity that was lacking under the IGA. This legal entity was needed for the purpose of managing, financing, and implementing the project. All four government partner agencies and the private partner participated in the governance of DUSPA (Barrett, 2014).
- **Denver Downtown Development Authority (DDA):** DDA was created by statute. It comprised 40+ acres in the Central Platte Valley and was the only downtown renewal authority at that time (Barrett, 2014; AK, 2013). Figure 20 shows the area of the DDA. DDA had statutory authority to use TIF, which lasted for 30 years (5 years longer than a TIF through urban renewal authorities) unless obligations were retired earlier. The DDA plan area included the DUS project area (19.5 acres) plus an additional 25 acres. DDA entered into an agreement with CCD to remit TIF to DDA, which DDA pledged to pay debt incurred as part of DUS. Certain taxing entities were excluded from the DDA area and TIF payments, including the Central Platte Valley Metropolitan District and Cherry Creek Subarea Business Improvement District DDA (AK, 2013).
- **DUS Metropolitan District Nos. 1 through 5 (Met Districts):** The CCD established "Met Districts," statutory metropolitan districts that levied property taxes (like special assessment districts). Boundaries of Nos. 1 through 3 included the 19.5-acre site, and those of Nos. 4 and 5 include Market Street station. The districts had the following characteristics:

  – These Met Districts were not-for-profit corporations organized by CCD for managing, financing, and implementing the DUS.
  – They were defined as "enterprises" under Colorado's Taxpayer Bill of Rights, each with authority to issue revenue bonds and operate "on behalf of issuer" for federal tax purposes (allowing issuance of tax-exempt debt).
  – During the TIF period, revenues generated from the 20 mills of incremental property tax would be payable through DDA, and thereafter for an additional 11 years, payable through the Districts (AK, 2013).

Figure 21 shows the public and private partners in the DUS project.



Source: Barrett, 2014.
Figure 20. DUS value capture map.

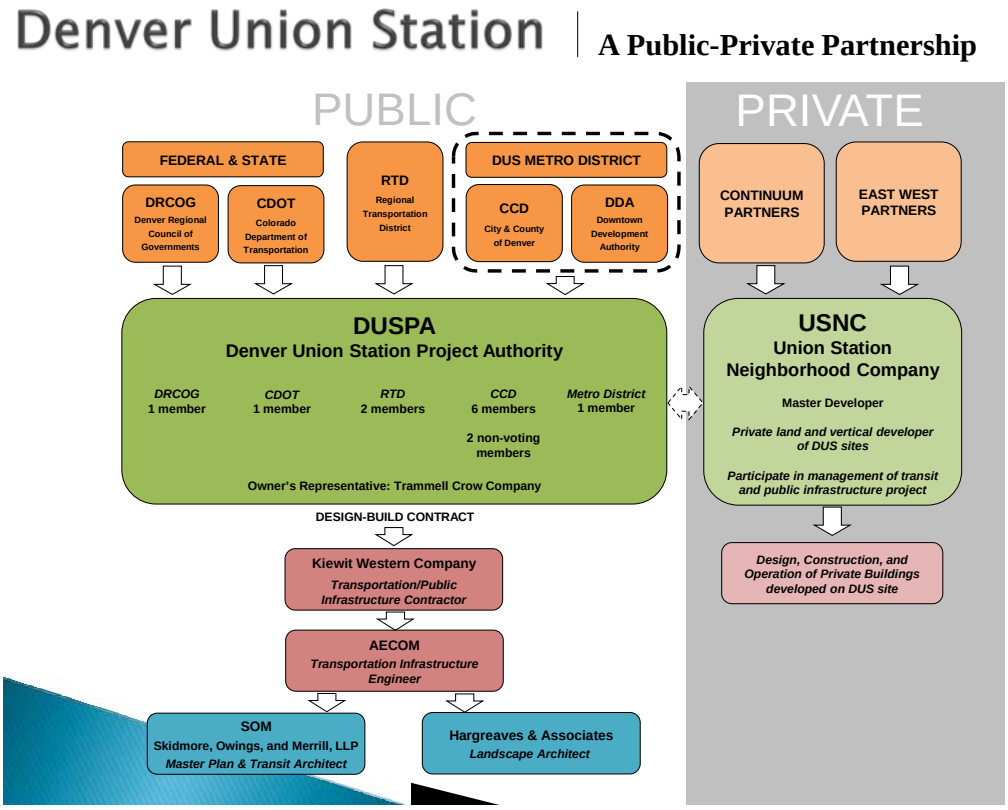
V Business Case

Following master plan approval, the DUS partners led a request for qualifications (RFQ) process that led to the master developer selection of a master developer. DUS partners selected Continuum/East-West Development Partners (now called Union Station Neighborhood Company or USNC) from 11 competing entities in 2006. The master plan called for approximately 1 million ft^2 of office space, up to 300 residential units, a hotel, and 100,000 ft^2 of retail/commercial space—based on previously undertaken real estate planning studies.

USNC was able to propose a lower budget of $480 million, which was much lower than the budget originally envisioned by planners. This was achieved, in part, by putting all light rail, commuter rail, and intercity rail facilities at grade. The bus station, however, was located below grade, with some changes in configuration.

DUSPA entered into a letter of intent with USNC in 2008 to develop the station site. Kiewit Construction would complete the transportation elements of the work under a guaranteed maximum price contract. USNC would receive a development management fee of $10.4 million to plan and design elements of the site, and USNC committed to purchase various development parcels from the RTD that would eventually total $27 million and agreed on a takedown rate of 8% of that amount per year to retain the rights to develop.

USNC has met all of its commitments to date, and every parcel is now either fully developed, built and on the tax rolls, or under construction (Personal communication, 2016).



Source: Barrett, 2014.

Figure 21. DUS project organization.

VI Local Economic Conditions and Market Considerations

DUS was intended to be a major node of Denver's light rail system. Part of the rationale for the project was to help lift Denver out of a long recession that lasted through much of the 1980s. DUS was intended to focus and orient demand for new office, retail, and residential real estate in downtown Denver. CCD contracted with CBRE to prepare an independent analysis of downtown real estate demand, and CBRE found that that between 2.5 million and 3.0 million ft^2 of commercial and residential development would occur within the DDA district over the following 20 years (Denver Union Station Project Authority, 2011).

VII Creditworthiness, Finance, and Funding

VII.A Identification of Funding/Financing

The DUSPA process to identify funding sources included:

- Identifying funding needs,
- Determining source of borrowing, and
- Determining source/sources for repayment (Barrett, 2014).

DUSPA's analysis resulted in:

- Annuitizing the RTD FasTracks allocation (see discussion that follows), and
- Establishing a CCD framework for collecting incremental taxes on the site and surrounding parcels.

To issue the TIFIA and RRIF loans, the RDT sought a credit rating from Fitch Ratings. Fitch Ratings rated the senior lien TIFIA loan "A," which was one rating grade below RTD's AA sales tax rating. This rating was based on the following:

- Cash flow coverage was not dependent on development revenues, but primarily on the RTD portion of pledged revenues, or $12 million;
- The TIFIA lien was subordinate to RTD's FasTracks bonds; and
- "In addition to RTD's annual $12 million payment, pledged revenues on both levels of debt include incremental property and sales tax revenues collected within the DUS project area and DUS metro district mill levies. Development activity within the project area has exceeded original projections and Fitch expects development activity to continue. That said, Fitch considers the pace and scope of such development very speculative. As such, development-related revenues are not currently a rating factor for the senior lien note" (Fitch Ratings, 2015a).

VII.B Financing Evolution

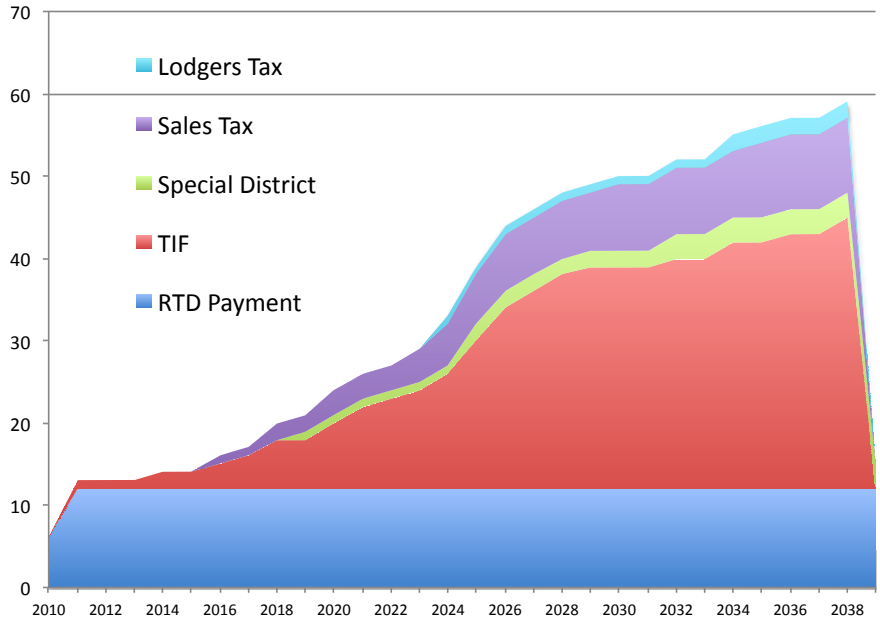
DUSPA originally assumed a financial plan based on tax-exempt securities to be sold in financial markets and serviced from RTD's FasTracks allocation ($208.8 million) and CCD TIF revenue. Unfortunately, during the global financial crisis, the tax-exempt markets were not viable when needed. In response, DUSPA turned to federal agencies and funding sources (Barrett 2014).

RTD pledged FasTracks sales tax monies of $209 million, less previous expenditures, amounting to $165 million for the DUS project. In addition, DDA pledged all tax increment revenue—a millage rate of 67—for 30 years to DUSPA in order to secure and repay the RRIF loan. Property taxes (20 mills) generated within the DUS project area for 11 years after the TIF expired (AK, 2013) were also pledged, which was an approximate 30% increase over the underlying base tax rate. The TIF district was expected to produce increasing levels of revenue as the master developer took down property.

The RRIF loan was secured by the full faith and credit (city-contingent commitment) of CCD. In the event of a shortfall in revenue available for debt service on the subordinate loan (RRIF), CCD would request that the city council appropriate up to $8 million annually during the term of the loan to make up any such shortfall (Denver Union Station Project Authority, 2011).

Figure 22 shows that TIF is ultimately expected to become DUS's major funding source. In the early years, however, payments from RTD's sales tax revenue receipts are expected to be the dominant source of funding. Some of these projections are based on CBRE's independent analysis (Denver Union Station Project Authority, 2011).

While TIF revenues and property taxes were expected to cover debt service, sales taxes and the city-contingent commitment provided a backstop in the event that these revenues were insufficient.



Source: Denver Union Station Project Authority, 2011.
Figure 22. Projections of DUS revenue sources.

VII.C Grant and Property Sale Sources

As is typical, DUS received a variety of federal and state grants (Barrett, 2014), including:

- $50 million from FHWA [Colorado Department of Transportation (CDOT)],
- $28.6 million in ARRA funds (DRCOG and RTD),
- $9.6 million from the FTA,
- $2.5 million from TIP, and
- $18.6 million via Senate Bill 1 (CO).

DUSPA also sold some property to provide additional funding for the project, as follows:

- $27 million for sale by RTD of five parcels of the 19.5 acres to USNC, and
- $11.4 million for sale by RTD of Market Street station property to CCD.

While such joint development monies were helpful to the financial plan, they did not compare in magnitude to the TIF and sales tax monies.

DUSPA received a TIFIA senior lien loan of $145 million, based on the following pledge (Financing Sources AK, 2013):

- RTD sales tax monies annuitized at 5.65% to $12 million annually, and
- Lodger's tax generated within the DUS project area to the extent appropriated by the CCD and pledged to DUSPA.

The RRIF loan, of $155 million, had a subordinate lien on the following:

- DDA and Metro district monies.
- Lodger's tax generated within the DUS project area to the extent appropriated by the CCD and pledged to DUSPA.
- The city's obligation (city-contingent commitment) that could be accessed in the event of a shortfall of pledged revenue available for debt service on the RRIF loan and the draw on the reserve fund established to secure the RRIF loan. In that case, CCD would request the city

council to appropriate annually during the term of the loan an amount sufficient to maintain the reserve fund at the required minimum amount. The maximum annual payment from the city, if funds were appropriated, would be equal to 50% of the maximum annual debt payment on the RRIF loan (Denver Union Station Project Authority, 2011).

RRIF did not require a security interest in the real property. This was unusual for a lender accustomed to receiving collateral in rail equipment and was the first time RRIF served as a subordinate lender, in this case to the TIFIA loan.

VII.D Union Station

One of the ironies of the DUS project was that Denver Union Station building was not part of the core project, aside from the connections to the adjacent rail platforms and bus station. RTD issued a separate request for proposals for the station development. The winning bidder transformed the developable parts of the historic station into a boutique hotel (City Staff, 2016).

VIII Takeaways

Key DUS takeaways include:

- **Many Moving Parts:** The DUS project is an example of how disparate stakeholders, funding sources, and project elements can be combined to create significant regional benefits. These were realized within a medium-sized U.S. metropolitan region and a highly multimodal facility. DUS employed a wide variety of innovative funding sources and financing mechanisms, including TOD, TIF, P3s, and innovative loan programs.
- **Role of Developers:** Through careful project reconfiguration, the developers were able to halve the cost of the project in order to make it financially feasible.
- **Flexibility and Innovative Finance:** Flexibility in financial planning was essential to success. With financial markets disrupted due to the global financial crisis, RTD turned to TIFIA and RRIF funds as replacement financing.
- **Long Timeline:** From planning through construction, the project took approximately 13 years to complete, which is typical of such complex projects.
- **Legal Complexity:** To access several funding sources and financing mechanisms, DUS required a number of complex legal contracts and the establishment of several corporate entities.
- **CCD Support:** While TIF and SAD revenues along with those from a small number of land sales were expected to be more than sufficient to cover financing needs, sales taxes and CCD support made it possible to achieve federal credit approval, which essentially required investment-grade credit quality at the senior lending level and near investment-grade credit quality at the subordinate lending level.

APPENDIX D

Hong Kong Mass Transit Railway Corporation, Hong Kong

I Case Selection

> Three premier examples of the successful use of value capture to finance public transport are in East Asian cities: Hong Kong, Singapore, and Tokyo…. The poster child for the use of value capture to fund public transport is the Hong Kong Mass Transit Railway Corporation (MTRC). The MTR system in Hong Kong is fully constructed, operated, and maintained without a financial subsidy from the government. In fact, the MTRC is a publicly traded corporation that earns profits for its shareholders, chief among them the government of Hong Kong (Salon and Shewmake, 2011).

Asian rail agencies operate under different mandates and constraints than their U.S. counterparts; the operating and regulatory environments, geographies, and ridership densities are different. Notwithstanding this, the success and effectiveness of Asia's integrated transit/development agencies bear consideration for U.S. transit agencies considering value capture potential.

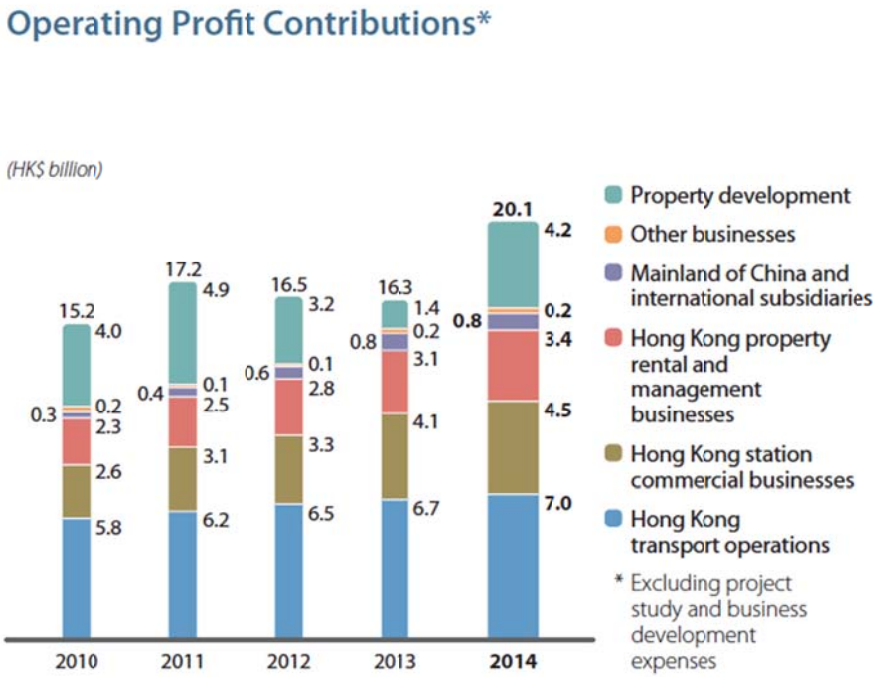
Hong Kong's Mass Transit Railway Corporation is an exceptional example of highly integrated transit and real property development. Unlike most of the world's transit systems, MTRC is profitable in large part due to extensively integrated transit-related and transit-oriented development activities and partnerships (Cervero and Murakami, 2008a, 2008b, 2009).

MTRC's success at effective value creation has been widely recognized. The Atlantic magazine called MTRC's business and service model "unique genius" (Padukone, 2013). CNN referred to Mass Transit Railway (MTR) as "the world's most envied metro system" (Wong, 2015). MTRC's successes, both as a rail transit provider and as an economic enterprise, stem from its Rail + Property (R+P) development model. R+P is a comprehensive strategy and is a highly developed "process for planning, supervising, implementing and managing station-area development and tapping into the land price appreciation that results" (Cervero and Murakami, 2008b). MTRC provides exemplary transit service and earns significant profit in the process. More than 60% of MTRC's revenue is derived from real estate property development, leasing, and management. As such, R+P may be the most successful transit-related value capture model in the world.

II History and Overview

MTRC serves an average of 5.4 million passengers per weekday. In the 10 years from 2005 through 2014, total MTR ridership increased from 856 million to 1.5 billion. Over the same

period, MTRC's annual operating profit increased from HK$8.6 billion to HK$15.8 billion (approximately $2 billion U.S.), total assets increased from HK$114 billion to HK$227 billion, and dividends to shareholders increased from HK$2.3 billion to HK$6.1 billion (approximately $787 million U.S.) (MTR Corporation, 2014).

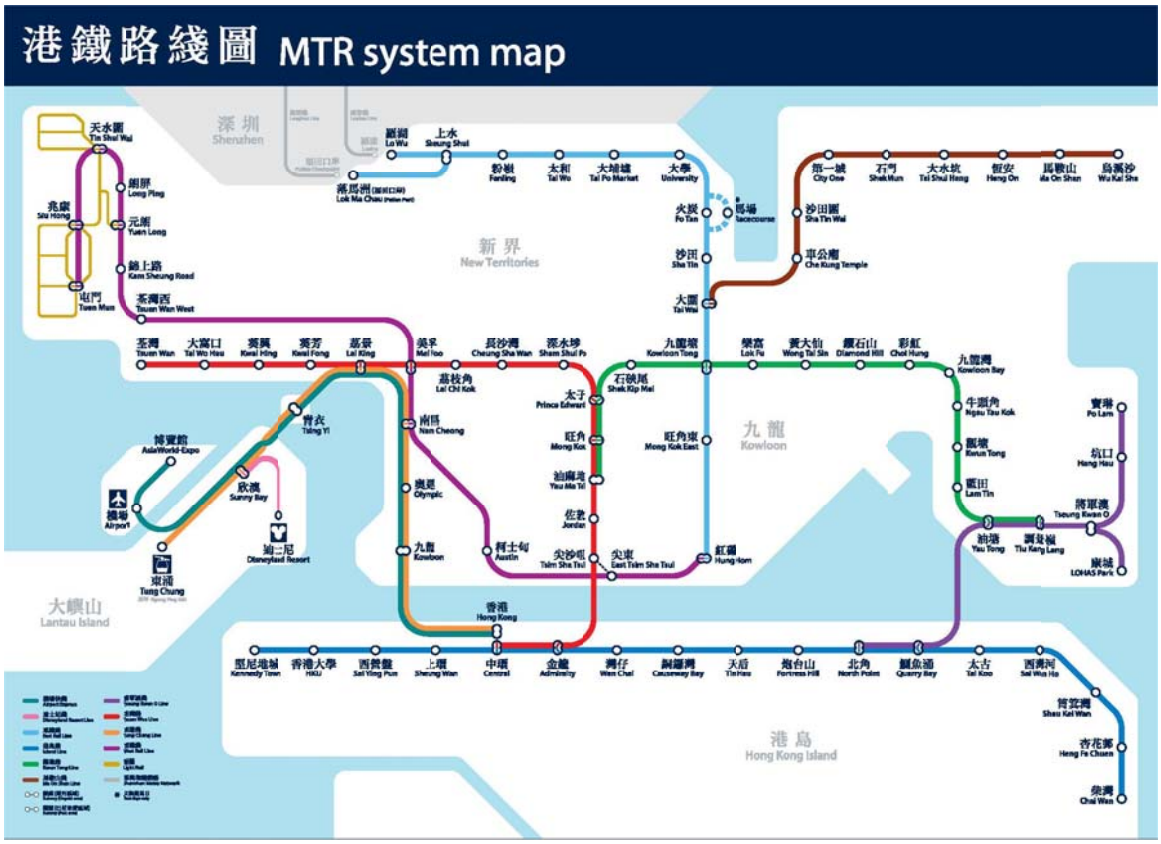


Source: MTR Corporation, 2014.

Figure 23. MTR operating profit contributions.

The MTR rail transit system includes nine lines intersecting each other at 19 interchange stations (as shown in Figure 24).

HKSAR established the MTRC in 1975 and began operating in 1979 as a public transit utility. In 2000, MTRC was privatized and began trading on the Hong Kong Stock Exchange as the MTR Corporation Limited (MTRCL)[6] in 2001. HKSAR sold 23% of the shares to the public and retained the balance. There are more than 250,000 private shareholders in MTRC, and it is a significant component of the Hang Seng Index. Private ownership reinforced significant market discipline in MTRC operations from the outset, and its market orientation and responsiveness remain evident today. HKSAR continues to provide public policy influence through its majority stake. HKSAR has publicly committed to retaining no less than 50% ownership through 2020.



Source: MTR, 2015.

Figure 24. MTR system map.

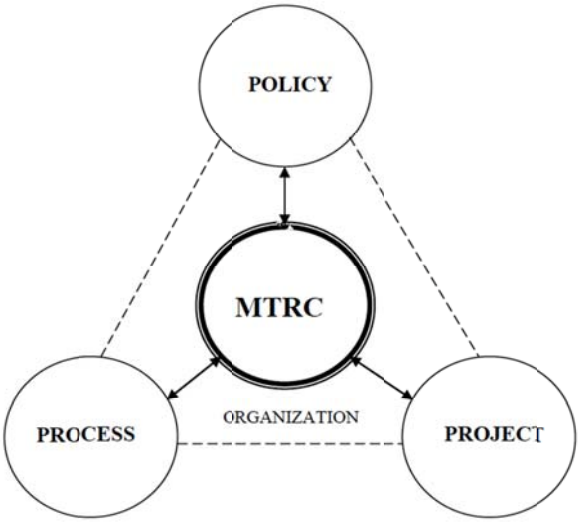
III Local Economic Conditions and Market Considerations

Hong Kong, with a population of 7.2 million as of mid-2014, is one of the most densely populated places in the world. Hong Kong's most densely populated district, Kwun Tong, has a density of approximately 148,000 people per acre (Hong Kong Government, 2015). Hong Kong is served by many transit systems, which include light rail and multiple tram, bus, mini-bus, and ferry systems. Approximately 90% of Hong Kong's motorized vehicle trips are by public transit, the highest proportion in the world (Cervero and Murakami, 2008b; Lam and Bell, 2002; Zhang, 2007).

The comprehensive Study of the Integrated Rail-Property Development Model in Hong Kong found that 41% of the total population and 41% of workers lived within 0.31 miles (500 meters) of an MTR station. MTR provided 24% of all public transportation in Hong Kong (Tang, et al., 2004).

IV Capacity, Organization, Coordination, and Partnership

MTRC's integrated rail and property development model is a unique version of joint development and P3. The R+P model goes far beyond collaboration and joint enterprise. It embodies both philosophy and strategy for maximum value creation and capture. MTRC's R+P model incorporates four key elements (as shown in Figure 25).



Source: MTR Corporation, 2014.
Figure 25. MTRC's R+T model.

- **Policy**: Favorable government policy support in terms of its exclusive land grant to the MTRC and its commitment to mass transit railway as an essential mode of public transport;
- **Process**: Far-sighted planning, management, and control procedures and effective development processes that seek to maximize the synergy between railway and property from the stages of project inception to completion;
- **Project**: Development of high-quality real estate projects that contain high development density, appropriate land use diversity, and attractive layout design and that integrate well with the railway facilities at the appropriate locations and at the right timing; and
- **Organization**: A well-experienced and efficiently managed company that is committed to providing world-class railway services and developing top-quality property development projects in order to enhance the quality of life in Hong Kong (Tang et al., 2004).

MTRC's integrated rail-property development program is designed explicitly to minimize both direct and opportunity costs in the development of transit-adjacent development and TOD. R+P reduces the cost of imperfect knowledge on the part of transit and real estate developers that would exist in the absence of intimate strategic partnerships. MTRC has extensive specialized knowledge and experience in planning and developing integrated railway properties. This contrasts with the uncertainty of experienced by developers in the United States. This is particularly true given the intensely urban, high-density, mixed-use nature of many of MTRC's

projects including station development. Site and architectural design, civil and structural engineering, and financial and functional programming are tightly interwoven between transit and real estate (Tang et al., 2004).

Figure 26. Kowloon Station, Hong Kong MTR.

Organizational integration and flexibility allows MTRC to reduce uncertainty, and hence risk, between public- and private-sector activities and to respond more quickly to changes in market conditions. Operating subject to market discipline and commercial principles has allowed MTRC to reduce financial risk and uncertainty (Tang et al., 2004). This is shown in MTRC's strong credit ratings (see Figure 27).

	Short-term	Long-term
Standard & Poor's	A-1+/A-1+	AAA/AAA
Moody's	-/P-1	Aa+1/Aa1
R&I	a-1+	AA+

Source: MTR Corporation, 2014.

Figure 27. MTR credit ratings.

As a combined enterprise, the transit and real estate development divisions of MTRC are incentivized to maximize value creation and subsequent capture through synergies rather than competition between railway operations and property development. Beyond corporate integration of functions, joint public–private ownership of the common stock of MTRC provides both mutuality of interest and joint benefit. HKSAR's 77% ownership stake was worth approximately U.S.$606 million in dividends alone in 2014.

V Regulatory Considerations

From a value capture perspective, MTRC's R+P program is borne entirely from regulatory entitlement. HKSAR grants or endows land, through long-term renewable leases, to MTRC at prices usually below market.[7] This process between MTRC, HKSAR, and developers is illustrated in Figure 28. Given that HKSAR owns 77% of MTRC, HKSAR is granting endowments to itself to a large degree. In exchange for the 23% of the value of endowments that are essentially given away to private shareholders, HKSAR receives higher value creation and subsequent tax revenue from properties developed by MTRC. Additional value is created through development by others and enhanced through extensive planning and design expertise by MTRC. Additionally, HKSAR benefits from its receipt of MTRC dividends.

Endowment of land is "necessary but not sufficient to insure the success of the R+P business model" (Salon and Shewmake, 2011). Attempts to employ the R+P financial model outside of Hong Kong have failed where "government policies and actions were not fully supportive of public transport-coordinated property development" (Salon and Shewmake, 2011). Recurring problems with projects undertaken by the Guangzhou Metro Corporation are examples (Tang et al., 2004).

The success of the R+P model is driven by market opportunity in creating and capturing value in real property. There is no economic incentive to provide nonmarket products such as affordable housing. Significant profit realized by HKSAR through majority ownership in MTRCL, however, provides resources to invest in or subsidize such products.[8]

VI Business Case

Unlike many quasi-independent agencies where commitment to specific technical solutions, operational mandates, or funding mechanisms may insulate transit development from market responsiveness (Boschken, 2000), MTRC operates on strictly commercial principles. R+P activities are focused on value creation in response to market conditions and context. The Hong Kong model is, in a sense, development-oriented transit as opposed to TOD. It is not difficult to understand the focus on development, particularly when there is so much transit demand in place, and that demand is reinforced through TOD. As seen in Figure 23, the bulk of MTRC's revenue and operating profit is achieved through property development, real estate rental and property management services, and transit station commercial businesses.

MTRC develops and evaluates prospective rail alignments and station improvements in close consultation with HKSAR. Based on preferred alignment alternatives, MTRC develops construction cost estimates and negotiates prospective land acquisition and development concepts. Both parties are vested in a process and end result that maximizes quality, efficiency of investment, and financial return.

MTRC and HKSAR then negotiate formal agreements that include obligations of MTRC and terms of land acquisition in the form of long-term renewable leases from HKSAR. MTRC then secures necessary planning, regulatory, and development approvals. Once approvals are in hand, MTRC publishes "tender packages" and solicits requests for proposals from developers.

Successful bidders are responsible for detailed project design and development. MTRC undertakes major civil engineering and construction and enforces technical standards regarding interfaces with transit facilities and infrastructure. The private development team is responsible for all design and acquisition costs, marketing costs, construction, and finance. Developers may not collateralize development financing with partnership land interests. MTRC assumes no liability for development losses but participates only in the upside. MTRC benefits not only from up-front, one-time, land premiums but from equity partnership in developed properties.

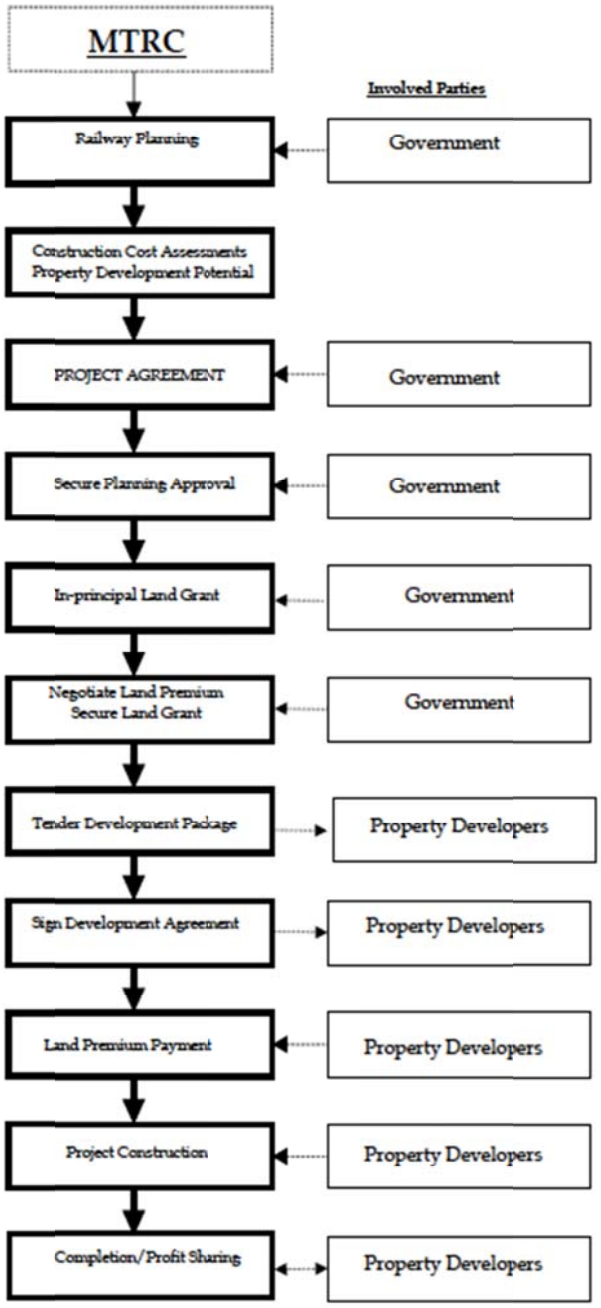


Figure 28. MTRC, HKSAR, and developer development process.

Although MTRC no longer receives cash subsidies from HKSAR, it receives land grants or long-term renewable leases[9] at pre-transit/predevelopment prices. These in-kind contributions of real property have created the bulk of the R+P opportunity. Although MTRC creates significant value on property owned by others, direct or joint development of its own properties creates the value that pays for transit development and creates profits.

MTRC's portfolio is diversified in terms of structure (debt, equity, partnership, management, advertising) and in terms of property type. MTRC owns interests in residential properties across a range of densities, office buildings, mixed-use properties, telecommunications facilities, and retail spaces.

As elsewhere, ridership and price premiums resulting from Hong Kong residents' willingness to pay for transit accessibility can be affected by other TOD and urban amenities. A 2009 hedonic price model of the value of scenic views found residential price premiums of approximately 3% for broad harbor views and price discounts (or penalties) of 3.7% for street views (Jim and Chen, 2009).

VII Takeaways

Key takeaways from the Hong Kong Mass Transit Railway Corporation case for U.S. agencies include:

- **Transit Loss Leader:** Even with high population density, intensive ridership, and high market share, rail transit is not financially viable on its own. MTRCL realizes no direct financial return on its railway investment.
- **TOD Value:** When combined with transit-oriented designs, notably high-quality walking environments and mixed land uses, this case study shows that R+P projects are likely to be more successful in terms of ridership and real estate profits (Cervero and Murakami, 2008b). There are hints that the combination of R+P and transit-oriented designs produces synergistic effects—proportionally higher rents in addition to ridership bonuses (Cervero and Murakami, 2008b).
- **Early Agreements:** By means of development agreements, MTRC ensures compliance from developers in implementing the adopted master plan proposals of the station development. This is better than subsequent separate negotiations between the railway operator and the adjoining property owners, which often produce second-best and remedial outcomes (Tang et al., 2004).
- **TOD Spurs Ridership:** Mixed-use, compact, vibrant street-level activity promotes transit ridership. Furthermore, integrated rail-property development projects incorporating excellent design and programming also enhance ridership as well as value creation.
- **Unique Benefit of Land Ownership**: MTRC does not rely on government subsidies to support its rail service, yet it does benefit from below-market property sales.
- **Institutional Capacity:** Sophisticated business and development strategy and acumen on the part of MRTCL have been critical to its success in real property development.

APPENDIX E

Kansas City Streetcar, Kansas City, MO

I Overview and Description

On May 6, 2016, a 2-mile modern streetcar system opened for service in downtown Kansas City, MO, traversing the heart of downtown from the River Market to Union Station. Construction of the $102 million starter line began in May 2014. In its first 2 days of operation, the new streetcar system served more than 32,000 riders, for a total of over 50,000 passenger miles, exceeding expectations. The City of Kansas City funded construction of the streetcar with $37.1 million in grants from the FTA for construction of the system and acquisition of vehicles. Local revenue sources, including the downtown streetcar transportation development district (TDD), a special assessment district, funded the balance (Kansas City, 2014).

This first phase of the streetcar system was envisioned as part of a new and modern streetcar network that would support a transforming downtown business district and improve mobility in the urban core. The 2-mile starter line has 16 stops and uses four American-built vehicles. The project became a multifaceted investment that included water and sewer main replacements, utility relocation, and upgrades to 24 other utilities. In addition to underground utilities, the project includes modern technological enhancements. The streetcar's 16 accessible stops include digital kiosks, 125 LED streetlights, Wi-Fi networks, and video technology.

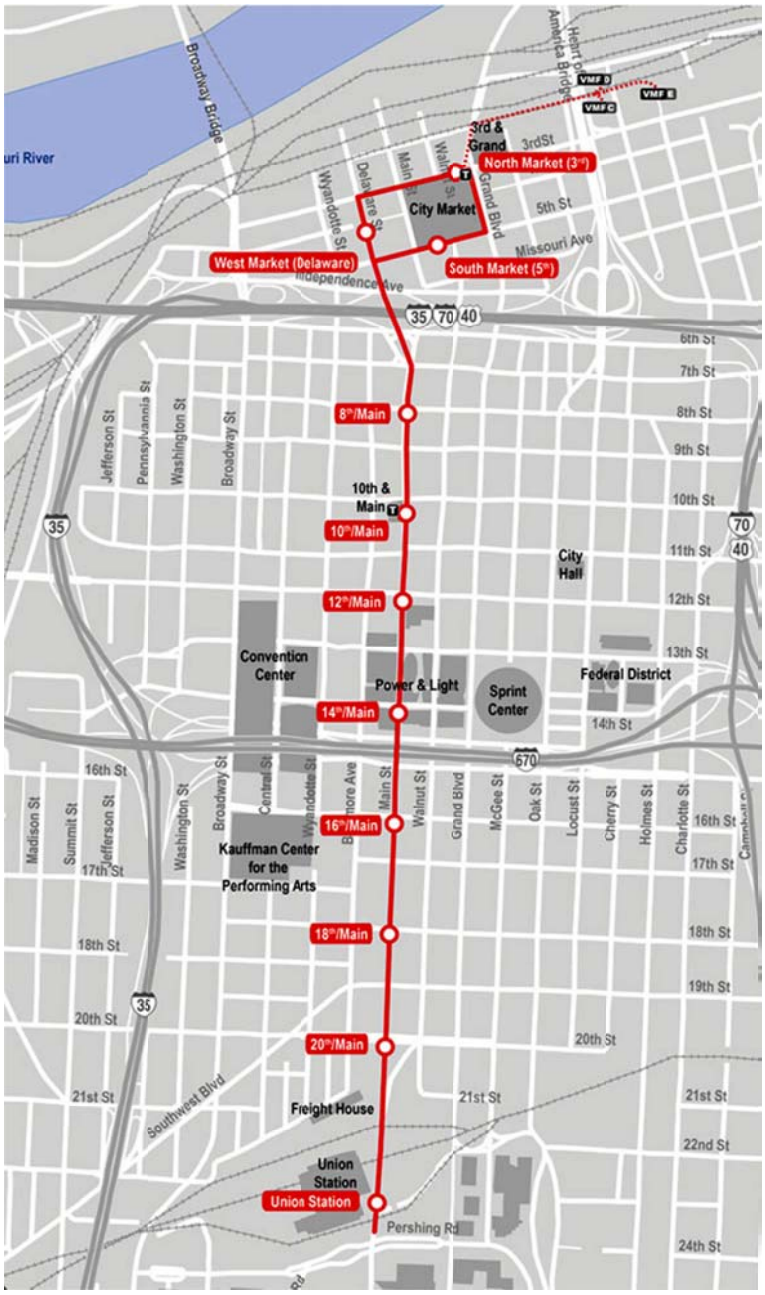
The city entered into a tri-party agreement with a voter-approved transportation development district and a city-created not-for-profit, the Kansas City Streetcar Authority, Inc., which specifies and oversees funding, design, construction, and ongoing operations and maintenance of the system.

Prior to this successful streetcar initiative, three previous streetcar initiatives failed in Kansas City. All three of these included a broader network (between 14 and 27 miles) than the current 2-mile project approved in 2012.

II Project Funding Sources

Total capital cost for the downtown streetcar project is $102 million. Federal grants received for the construction of the streetcar system included a $16 million Surface Transportation Program (STP) grant (used primarily for vehicles), a $1.1 million Congestion Mitigation and Air Quality (CMAQ) Improvement Program grant, and a $20 million Transportation Investment Generating Economic Recovery (TIGER) grant. Table 15 provides a detailed breakdown capital funding sources.

Approximately 60% of the capital costs for the project were paid for by a special obligation bond issued in 2014. Funds collected through assessments and taxes associated with the TDD around the streetcar line are used to retire the bonds. Further discussion of TDD follows.



Source: Kansas City Streetcar Project, 2016.

Figure 29. Kansas City downtown streetcar corridor map

Table 15. KC streetcar capital sources, 2012.

Capital Sources	Amount
Special obligation bond (repaid through TDD)	$62,900,000
TIGER grant	$20,000,000
CMAQ funds	$1,100,000
Surface transportation program funds	$16,000,000
City commitment	$2,000,000
Total	**$102,000,000**

Source: Kansas City, 2013.

The 2016 budget for Kansas City's streetcar includes $4.4 million in debt service and $2.8 million provided to the streetcar authority for managing, operating, and maintaining the system. Debt service and operating costs are funded through property and parking assessments for properties located within the TDD, in addition to a one-cent sales tax within the TDD. According to the fiscal year (FY) 2017 Kansas City budget, operations and debt service for the streetcar program amount to $9.2 million annually. The streetcar is fully funded by the TDD and receives no general fund support from the city (Kansas City, 2016b).

III Local Economic Conditions and Market Considerations

In the decade before the construction of Kansas City downtown streetcar, the downtown area experienced resurgence and transformation into a vibrant economic center. From 2000 to 2013 (the year before construction started on the project), investment totaling nearly $6 billion from both public and private sources stimulated economic activity and development. Approximately $4.5 billion of that investment is reflected in Table 16. In addition, more than $1 billion in residential development occurred in downtown Kansas City over the same period.

Table 16. Major commercial investments in downtown Kansas City, MO, 2000–2013.

Type of Development	Amount Invested
Office space	$1,614M
Convention/hotel	$259M
Arts, culture, and entertainment	$1,054M
Religious	$9M
Mixed use	$402M
Healthcare	$658M
Transportation	$419M
Total	$4,530M

Source: Downtown Council of Kansas City, 2015.

From 2013 to 2016 alone, the combined cost of commercial and residential development within the TDD was $1,709.5 million.

IV Capacity, Organization, Coordination, and Partnership

In 2012, the city established a public–private partnership to manage the streetcar system. This partnership is governed and defined by a tri-party agreement that details the funding, design, construction, and ongoing operations and maintenance of the streetcar system. The city entered into an agreement with the Kansas City Downtown Streetcar Transportation Development District and the Kansas City Streetcar Authority (KCSA). Per the terms of the agreement, the streetcar will be operated and managed by KCSA. In addition to overseeing streetcar operations, KCSA supports system branding, marketing, safety oversight, public communications, and community engagement.

KCSA is a not-for-profit corporation established by the city after the TDD vote and is composed of 13 individuals representing private citizens, business, and government interests within the TDD. KCSA's executive director has responsibility for managing the streetcar system and contracting with third parties to handle marketing and branding, maintenance of the track, and operational issues such as routing, dispatch, and transfers. KCSA has a 13-member board of directors. Seven of the directors are private individuals who reside or own properties or businesses within the TDD. The other six directors are appointed by the city or the Port Authority of Kansas City through various processes. Table 17 shows KCSA's budget.

Table 17. Kansas City Streetcar Authority budget.

	Actual FY 2014-15	Adopted FY 2015-16	Adopted FY 2016-17
Allocation by Expense Category			
Contractual Services	$112,457	$2,774,500	$3,966,014
Commodities	-	-	8,000
Capital Outlay	-	-	766,145
Debt Service	4,753,190	4,935,100	5,989,681
Grand Total	**$4,865,647**	**$7,709,600**	**$10,729,840**
Allocation by Program			
Street Car	$4,865,647	$7,709,600	$10,729,840
Grand Total	**$4,865,647**	**$7,709,600**	**$10,729,840**
Allocation by Fund			
Street Car	$4,547,773	$7,209,600	$9,179,909
Capital Improvements	317,874	500,000	1,549,931
Grand Total	**$4,865,647**	**$7,709,600**	**$10,729,840**

Source: Kansas City, 2017.

The FTA considers KCSA a no-bid third-party contractor because it was appointed, rather than selected through a competitive process, to its role within the tri-party agreement. The FTA's current interpretation of the city's relationship with KCSA makes the city ineligible for operational grants on the KC streetcar starter line. Because a local funding mechanism exists for operations, the city has not used and does not plan to apply for FTA operational grants on the KC streetcar starter line and is thus not in conflict with current FTA grant agreements. Additionally, the tri-party agreement calls for revenue generated by the streetcar to be deposited into KCSA's accounts. Table 18 details the major participants of the project and their respective roles.

Table 18. Major project participants.

Partner	Role
City of Kansas City (KCMO)	Local project sponsor providing local funding match for federal grants; led environmental analysis, design, and procurement of project
Kansas City Area Transportation Authority	Provides transit service in KCMO and coordinates with KCMO to implement project
Mid-America Regional Council	The region's metropolitan planning organization; leads the region's long-range transportation plan
KCSA	Not-for-profit formed at the direction of the city council to provide the TDD taxpayers an active and ongoing role in the oversight and administration of the system
U.S. DOT	Provided a TIGER grant to this project

V Master Planning, Zoning, and Other Regulatory Considerations

Major public infrastructure investments, such as streetcars, can be catalysts for economic growth and development. In order to capitalize on its investment in streetcar infrastructure, Kansas City adopted zoning changes within a two-block radius of the streetcar route to ensure that the area would be positioned to take advantage of new development opportunities. Changes included adoption of zoning districts tailored for dense, mixed-use urban development downtown and the removal of mandatory off-street parking requirements for new businesses. These changes were proposed and adopted in 2012 (Kansas City, 2012).

These changes were also in concert with efforts started in 2010 to rezone and create new development standards for the Downtown Loop area. This is part of the overall implementation program for the Greater Downtown Area Plan. The goal of the rezoning and revised development standards is to implement the land use and development recommendations of the Greater Downtown Area Plan (Kansas City, 2015).

The two resulting zoning districts used near the streetcar alignment are DC (downtown core) and DX (downtown mixed use). (There is also a special exemption zone for off-street parking.) The purposes of the DC and DX zones are defined in the zoning code as follows:

- **88-130-02-B.DC, Downtown Core:** The DC district is primarily intended to promote high-intensity office and employment growth within the downtown core. The DC district regulations recognize and support downtown's role as a center of regional importance and as a primary hub for business, communications, offices, government, retail, culture, education, visitor accommodations, and entertainment. The district regulations are primarily intended to accommodate a broad mix of office, commercial, public, recreation, and entertainment uses. The DC district also accommodates residential development, both in a stand-alone, high-density form and mixed with office and retail uses.
- **88-130-02-C.DX, Downtown Mixed-Use:** The DX district is primarily intended to accommodate office, commercial, custom manufacturing, public, institutional, and residential development, generally at lower intensities than in the DC district. The DX district promotes a mix of land uses both horizontally (i.e., adjacent to one another) and vertically (i.e., within

the same building). Section 88-420-04-E of the code provides that "uses within the Downtown Loop are not required to provide off-street parking" (Kansas City, 2012b).

VI Transportation Development District

The Kansas City downtown streetcar TDD is a political subdivision of the state created to fund the streetcar. A TDD is an economic development tool established by property owners to tax themselves for transportation improvements. TDDs are a product of Missouri state law and require the creation of a TDD administrative board and for a county judge to rule on the lawfulness of the TDD. TDDs can be used to pay for parking garages, new roads, bus stops, or any variety of transportation improvements or infrastructure.

The Missouri Transportation Development District Act (the TDD Act) became effective on May 30, 1990 through §238.200-.275. The TDD Act provides for the formation of a transportation development district to fund, promote, plan, design, construct, improve, maintain, and operate one or more projects or to assist in such activity.

Missouri state law requires voter approval of a transportation development district. In 2012, the city and the Port Authority of Kansas City filed jointly for an election to form the TDD. Voters approved the district and authorized sales, property, and surface parking taxes to build and operate a downtown streetcar system. The TDD is wholly within the city and will operate within rights-of-way owned and controlled by the city.

VI.A Downtown Streetcar TDD

The downtown streetcar TDD was established through a concerted effort to target specific communities that would benefit directly from the 2.2-mile starter line. Resolution No. 120043, passed on January 19, 2012, called for joint establishment of one or more TDDs. The petition to form the TDD was filed by the city and the Port Authority of Kansas City, MO, with the Jackson County Circuit Court for the purpose of implementing and funding the design, engineering, construction, and operation of a downtown streetcar (Kansas City, 2016a).

The process of creating the TDD included two approvals by voters. The first was a vote to approve the formation of the TDD, and the second was an election to approve the various sources and amounts of revenue. Revenue projections in the TDD financial model assumed no growth in property values or taxable sales beyond a modest inflation factor. Although most involved with the project believed that a fixed-rail streetcar system would spur growth and redevelopment of vacant and underused parcels within the corridor, a conservative set of assumptions was used in development of the financial models to prevent overestimation of future value within the TDD. Kansas City believed that conservatism helped it establish high levels of credibility with the property owners along the line and did not speculate too highly on the value proposition of the streetcar.

Final TDD assessments, approved by voters, were:

- **A sales tax** not to exceed 1% on sales within the Phase 1 TDD boundary.
- **A special assessment on real estate** within the Phase 1 TDD boundary, with maximum annual rates as follows:
  - 48¢ for each $100 of assessed value for commercial property ($1,536 for each $1 million of market value);
  - 70¢ for each $100 of assessed value for residential property ($266 for each $200,000 of market value);

- $1.04 for each $100 of assessed value for property owned by the city (which would mean a total annual city payment of about $810,000); and
- 40¢ for each $100 of assessed value for real property exempt from property tax, such as religious, educational, or charitable property, but only on market value of more than $300,000 and less than $50 million.

- **A supplemental special assessment on surface pay parking lots** within the Phase 1 TDD boundary (not garages and not free parking lots). The maximum rate for the supplemental special assessment on surface pay parking lots will be $54.75 per space per year (Kansas City, 2016a).

Pro forma estimates from a Moody's 2014 report suggest that the sales tax and property assessments would generate $3.5 million and $4.2 million per year, respectively.

VI.B Expanded TDD Effort

Following the success of the first TDD, Kansas City embarked on an effort to expand the streetcar system beyond the initial 2.2-mile starter line. A planning effort was initiated to assess the potential of additional streetcar lines for the system, and three lines were selected as preferred expansion routes. The expansion plan extended the starter route farther south on Main Street to the University of Missouri–Kansas City, east on Independence Avenue to Benton Boulevard, and east on Linwood Boulevard to Prospect Avenue. In order to fund the expanded system, Kansas City proposed to voters an expanded TDD.

The proposed TDD expansion included a sales tax sunset of 30 years and a special assessment sunset of 25 years. The special assessment rates for the expansion TDD would be no more than the maximum approved rate for the Phase 1 TDD. Following are the assessments proposed to voters within TDD expansion areas:

- $66.50/year for every $50,000 of residential property market value (as assessed by Jackson County);
- $1,536/year for every $1,000,000 of commercial property market value (as assessed by Jackson County); and
- Special assessments that would also be imposed on property owned by the city and by not-for-profit entities (property valued under $300,000 would be exempt), as well as surface pay parking lots (Kansas City, 2016a).

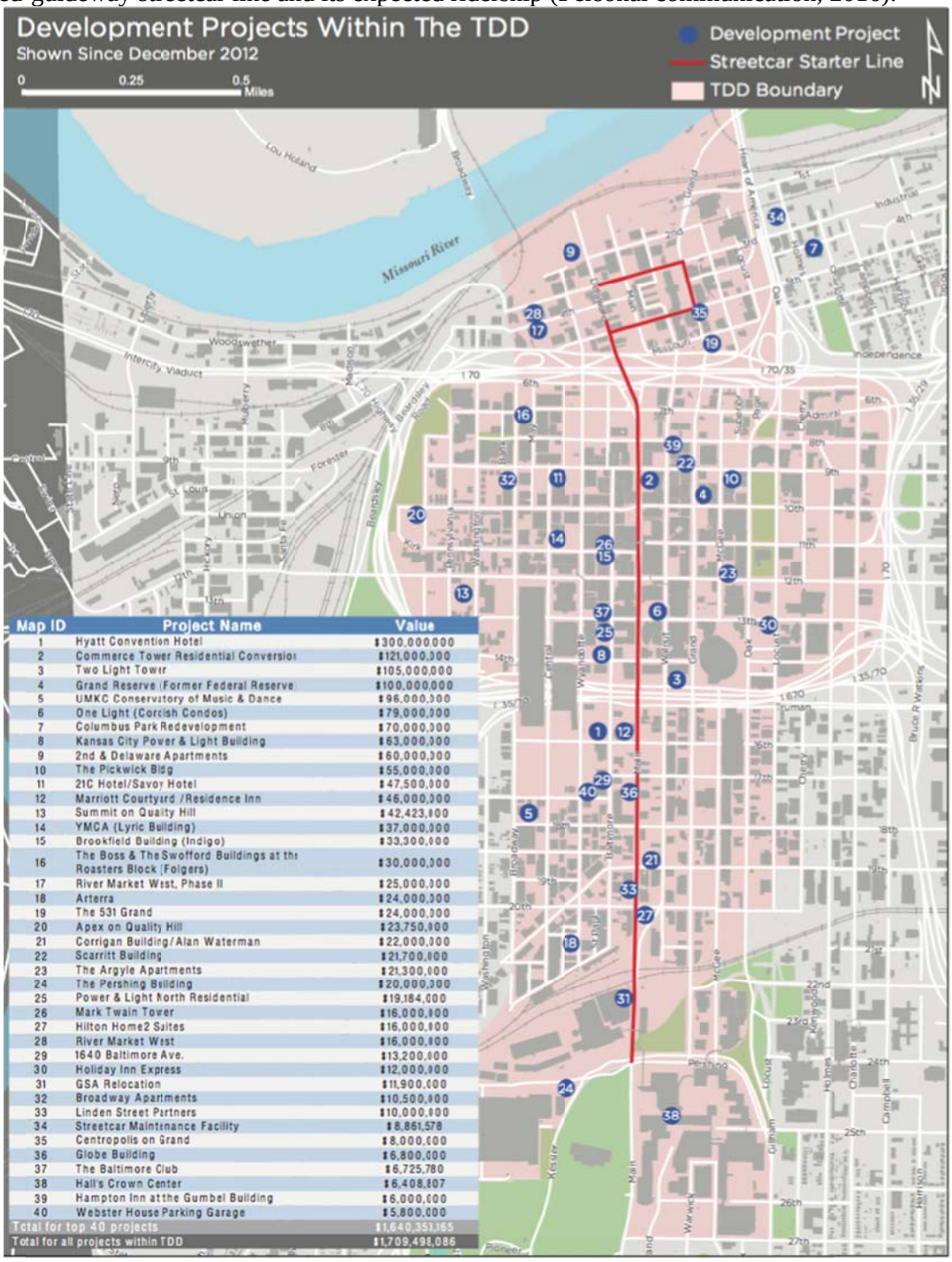
None of the TDD tax rates or assessments would have gone into effect unless the city secured enough federal or state matching funds to make the project feasible.

Creating and funding the expansion TDD required two public votes. The first vote, in August 2014, asked voters to approve creating the expansion TDD. Voters rejected this proposal, with 60% voting against. Although the second vote, planned for November 2014, would have asked for voter approval for specific revenue sources and levels of assessment, it never come to fruition because the first vote did not pass (Ishmael, 2014).

VII Creditworthiness, Finance, and Funding

The City of Kansas City, MO, issued special obligations bonds to pay for the construction of the streetcar. Funds collected through the TDD will be used to retire these bonds. Every new structure built within the TDD adds revenue unanticipated in the pro forma TDD financial model, minimizing estimated future burdens on sales tax and assessment revenues. Extensive new construction and rehabilitation activity suggests that real estate developers have not been turned

away by the additional assessment burdens but may perceive benefits related to proximity to the fixed-guideway streetcar line and its expected ridership (Personal communication, 2016).



Map ID	Project Name	Value
1	Hyatt Convention Hotel	$300,000,000
2	Commerce Tower Residential Conversion	$121,000,000
3	Two Light Tower	$105,000,000
4	Grand Reserve (Former Federal Reserve)	$100,000,000
5	UMKC Conservatory of Music & Dance	$96,000,000
6	One Light (Corcish Condos)	$79,000,000
7	Columbus Park Redevelopment	$70,000,000
8	Kansas City Power & Light Building	$63,000,000
9	2nd & Delaware Apartments	$60,000,000
10	The Pickwick Bldg	$55,000,000
11	21C Hotel/Savoy Hotel	$47,500,000
12	Marriott Courtyard /Residence Inn	$46,000,000
13	Summit on Quality Hill	$42,423,000
14	YMCA (Lyric Building)	$37,000,000
15	Brookfield Building (Indigo)	$33,300,000
16	The Boss & The Swofford Buildings at the Roasters Block (Folgers)	$30,000,000
17	River Market West, Phase II	$25,000,000
18	Arterra	$24,000,000
19	The 531 Grand	$24,000,000
20	Apex on Quality Hill	$23,750,000
21	Corrigan Building/Alan Waterman	$22,000,000
22	Scarritt Building	$21,700,000
23	The Argyle Apartments	$21,300,000
24	The Pershing Building	$20,000,000
25	Power & Light North Residential	$19,184,000
26	Mark Twain Tower	$16,000,000
27	Hilton Home2 Suites	$16,000,000
28	River Market West	$16,000,000
29	1640 Baltimore Ave.	$13,200,000
30	Holiday Inn Express	$12,000,000
31	GSA Relocation	$11,900,000
32	Broadway Apartments	$10,500,000
33	Linden Street Partners	$10,000,000
34	Streetcar Maintenance Facility	$8,861,578
35	Centropolis on Grand	$8,000,000
36	Globe Building	$6,800,000
37	The Baltimore Club	$6,725,780
38	Hall's Crown Center	$6,408,807
39	Hampton Inn at the Gumbel Building	$6,000,000
40	Webster House Parking Garage	$5,800,000
Total for top 40 projects		$1,640,353,165
Total for all projects within TDD		$1,709,498,086

Source: Kansas City, 2016a.

Figure 30. Phase 1 TDD map.

Special obligation bonds issued in 2014 received an "A1" rating by Moody's and an "AA-" rating by Standard and Poor's (Moody's Investor Service, 2014). Of these Series 2014A bond proceeds, $62.9 million was applied to capital costs for the streetcar project.

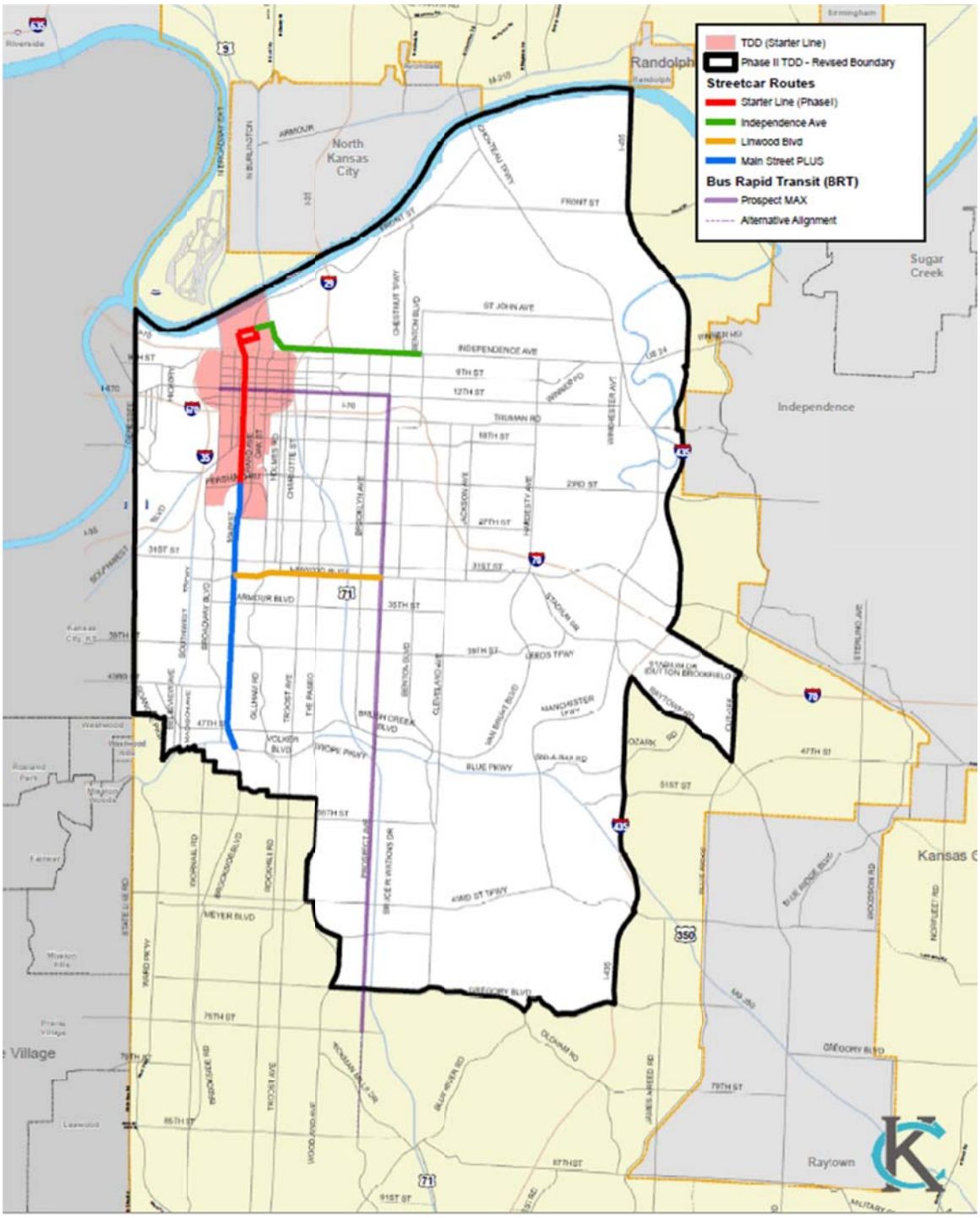
The "A1" rating on the special obligation bonds incorporated the city's fundamental credit quality, risk of appropriation, the lack of pledged assets securing the debt, and the non-essential nature of the project financed. Key strengths of these bonds were as follows:

- Area has a large and diverse economy and population, and is an employment hub of western Missouri/eastern Kansas;
- Management's proven record at closing large, multiyear budget gaps;
- Substantial liquidity available outside the general fund;
- Recent passage of pension reform, providing greater long-term fiscal health and viability for the city's four pension plans; and
- Continued support from the earnings tax, a voter-approved revenue source (approved in 2011 by 78% to 22% margin) (Moody's Investor Service, 2014).

VIII Takeaways

The Kansas City streetcar project is an example of a U.S. streetcar project that was successful in capitalizing on value generated within the project area's boundaries. As with all projects, the Kansas City streetcar comprised many unique elements. A number of strategic choices made by Kansas City have contributed to the success of this system:

- **Focused and Concerted Appeal to Voters:** The initial downtown TDD was approved due partially to its focus and concentration on a small subset of stakeholders. The expanded TDD suffered from an inability to reach or persuade all voters within the expanded TDD with respect to the value a new streetcar system could bring.
- **Creativity in Organizational Structure:** Under Missouri law, only residents within a proposed TDD boundary can vote for its establishment. Unless they are also residents, property owners within the TDD, who will bear the economic burden of a TDD, are not eligible to vote regarding establishment. As part of its strategy toward establishment of the TDD, Kansas City created a not-for-profit organization, the KCSA, which included business and property owners who have significant responsibility for ongoing operation of the streetcar. Creation of KCSA helped to provide confidence in the project for property owners who would support significant project costs.
- **Meaningful Planning:** Kansas City adjusted its zoning codes in the area immediately surrounding the streetcar line in order to capitalize and position the area for redevelopment.
- **Managing Value Capture Burden:** The TDD assessment included parking lots, government property, and a mix of assessments and taxes. This flexibility distributed the burden associated with funding the TDD.
- **Conservative Estimation:** In modeling the revenue projection on which assessments were based, Kansas City deliberately assumed no additional development and no significant capital appreciation of real estate assets within the TDD. This conservatism went a long way toward providing confidence and comfort to the property owners and other stakeholders within the TDD.



Source: Kansas City, 2014.

Figure 31. Proposed Phase II extended TDD boundary map.

APPENDIX F

Portland Streetcar, Portland, OR

The streetcar system in Portland is perhaps the exemplary case among the modern-era streetcar systems operating in the U.S. The Portland streetcar lines are frequently pointed out for their strong role in promoting adjacent urban development, their relatively high ridership, and their relatively strong service performance (Brown, Nixon, and Ramos, 2015).

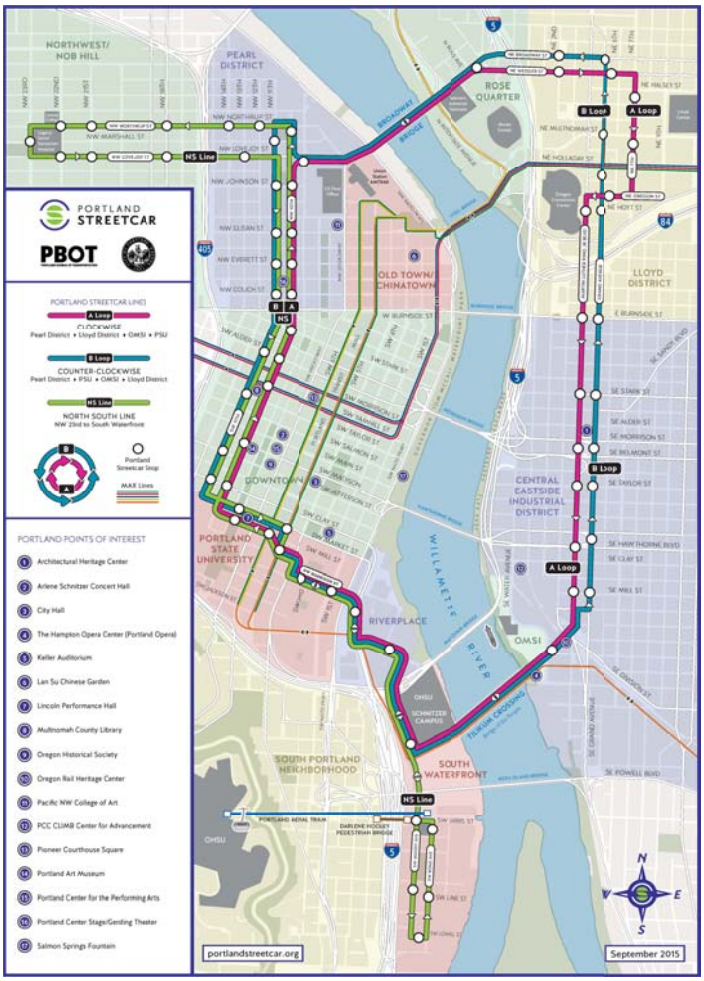
I Case Selection

The Portland streetcar system was chosen as a case study due to its high ridership, cost-effectiveness, and successes in structuring and implementing a productive public–private partnership and effective value capture strategies. Portland successfully developed a streetcar system that functions both as a transportation solution and as an economic and real estate development tool (McIntosh, Trubka, and Newman, 2015). Value creation along Portland's streetcar system also provides a useful corollary to observations regarding light rail or other transit modes. Portland transit agency representatives and planners have observed that streetcars seem to create value all along the line (Personal communication, 2016).

II History and Overview

Portland has a rich streetcar history. The Portland Street Railway Company began operating a horse-drawn service in 1872. In 1889, the Willamette Bridge Railway began operating an electric streetcar. A steam-powered cable car was introduced by the Portland Cable Railway Company in 1890. The Portland Railway, Light and Power Company "operated 40 lines over 300 miles of track with 583 streetcars" between 1906 and 1920 (Thompson, 2006). Portland streetcar service ended in 1932, and the interurban streetcar service between Portland and Oregon City was discontinued in 1958—the same year that the Portland Development Commission was created to foster urban renewal.

A preliminary concept for Portland's contemporary streetcar system was incorporated into the city's 1988 Central City Plan (City of Portland Bureau of Transportation, 2009). In 1996, funding for the first phase of a new streetcar system was approved by the City of Portland, the TriMet transit agency, and by the federal government. In 1999, a rolling stock manufacturer from the Czech Republic was selected to provide five streetcars. Ground was broken on April 5, 1999, and service between Legacy Good Samaritan Hospital and Portland State University commenced on July 20, 2001 (Ramos, Brown, and Nixon, 2015). Between 2004 and 2012, the system was expanded in four phases and now serves 76 stations with 11 cars on two lines extending over 7.35 miles of double track, most of which is in mixed traffic (see Figure 32).



Source: Portland Streetcar, 2015.

Figure 32. Portland Streetcar service map.

The Portland streetcar system is the first modern streetcar system in North America. The system was developed and expanded through public–private partnership and value capture strategies focused on special assessments and TIF. Portland's initial streetcar investment of $103 million (which grew to $251 million through all five phases) has induced billions of dollars of private investment and millions of square feet of residential, office, retail, hotel, and institutional development within the streetcar development corridors. Between 1997 and 2006, 55% of all central business district (CBD) development within Portland occurred within one block of the streetcar, whereas development within this corridor accounted for 19% of CBD development activity prior to 1997 (Adams, 2008).

III Local Economic Conditions, Market, and Value Creation Considerations

Market considerations were central to conceptualizing and implementing the Portland streetcar system and have been largely responsible for its success. Urban planners, long-term

streetcar/transit advocates, transit agency representatives, and the business community all point to the importance of early private-sector initiative in jump-starting the Portland streetcar project. Property and business owners and developers, motivated by opportunities for development, redevelopment, and revitalization of dormant urban areas, embraced local improvement districts (LIDs), specific forms of special assessment districts, as a means to contribute financially to the streetcar project. A 2015 study that included interviews with key stakeholders reported that special assessments were seen as a "financial and political strategy" that demonstrated strong private-sector commitment to the idea of a streetcar" (Ramos, Brown, and Nixon, 2015).

One regional transit planner reported that key stakeholders viewed the streetcar line as "more of a land use project than a transit project.… It was part of the package of a development strategy." Investors, property owners, and developers perceived the streetcar as a prospective catalyst for redevelopment. The initial phase of the streetcar system was associated with a redevelopment plan that included 10,000 new residential units and 3.5 million ft^2 of retail and mixed-use development. Planners have observed that although development entitlements are necessary to realize development, they are not sufficient to induce value creation. Further, the full development potential reflected in zoning entitlements is seldom realized (Personal communication, 2016).

Notwithstanding such observations, many of Portland's initial development goals have been achieved or exceeded. The city has attracted development of relatively high-density, mixed-use, pedestrian-friendly, urban amenity–rich environments, including some affordable housing, in areas that were previously blighted or abandoned.

Eric Hovee's 2008 study, Portland's Streetcar-Development Connection, used assessed valuation records to evaluate the value creation impacts of the streetcar. Tax assessor's records reveal that between 1997 and 2006, those properties near the streetcar developed at significantly higher densities, at significantly higher velocities, and with lower parking ratios than those further away. Prior to 1997, new development projects within the corridor were built to less than 50% of allowable density (FAR). "Since the streetcar alignment was chosen in 1997, new development [through the 2005 study date] achieved an average of 90% of the FAR potential within one block of the streetcar line. This percentage steadily dropped to 43% at three or more blocks from the alignment. Over the same period, building stock increased by almost 6% per year within one block of streetcar—more than triple the rate of any other central city geography. Within just 7 years, new development amounted to nearly half (46%) of on-the ground floor area within one block—compared to just 8% more than three blocks away" (Hovee, 2008).

Although the streetcar is widely perceived as a catalyst of positive change within the Pearl District, the South Waterfront, and the east side of the Willamette River, some of the leadership of the Portland Development Commission is understood to attribute relatively little of Portland's redevelopment and vitality to the streetcar (Personal communication, 2016).

IV Capacity, Organization, Coordination, and Partnership

The streetcar system is owned by the City of Portland but was designed and developed (and continues to be operated) by Portland Streetcar, Inc. (PSI), a not-for-profit corporation. PSI's board is representative of the public, city agencies, and private property owners within the streetcar corridor. Design, development, and operation of the streetcar have all benefitted from the multitude of perspectives and range of expertise represented by the board.

Prior to implementation of the streetcar and the TOD it induced, the Pearl District was largely abandoned industrial warehouse land and rail yards. Although contiguous to Portland's central

business district, it contributed little to the community's economic vitality. Many businesses, landowners, and developers perceived that the opportunity presented by the Pearl District's excellent location could be realized with transit service. Through the streetcar project, public and private interests were persuaded to invest in the transit line and TOD redevelopment of the Pearl District, including participation in a value capture strategy that included higher parking fees, special (LID) assessments, and TIF (Bachels and Newman, 2011).

Successful public–private TOD partnerships frequently require a local champion to lead partnership efforts toward successful value creation and capture. In the case of the Portland streetcar project, that champion was Vic Rhodes, the head of the Portland Department of Transportation (Schachter, Daniel, and Liu, 2014). Rhodes developed strategic partnerships between the City of Portland, TriMet, PSI, and private-sector developers and participants.

V Regulatory Considerations

V.A Oregon's Local Improvement Districts

Portland's streetcar system leveraged LIDs, a form of special assessment district, to finance all five phases of the project. A separate LID was established for each phase of the streetcar system. LIDs were created by city council resolutions in response to petitions by private property owners and are regulated by state law.

Although specific assessment methodologies varied from LID to LID, the goal was to capture some part of the value created directly as a result of the streetcar investment. Assessment methodologies were varied to account for variation in real property types and tenancies and to manage opposition from property owners. Owner-occupied residences were exempted from assessment. The State of Oregon LID required improvements to be substantially complete prior to assessments being levied. Once approved, projected LID revenues were used to secure LID-backed bonds that provided construction funding (Mathur, 2014).

Special assessments within five LIDs have comprised approximately $35 million, or 14% of the Portland streetcar's overall capital costs. LID contributions have ranged from 10% to 33% of individual segment costs.

V.B Oregon's Urban Renewal Areas Increment Financing

In 1951, the Oregon state legislature authorized the establishment of urban renewal areas (URAs) to undertake redevelopment of blighted areas using TIF and federal funds. In 1958, Portland established an urban renewal agency called the Portland Development Commission (PDC). The PDC has established 20 URAs, 11 of which remain active. Oregon's TIF districts are referred to as urban renewal areas and require a "finding of blight" for creation. Oregon allows use of TIF to fund transportation infrastructure capital costs but not operations or maintenance. TIF can also be used to fund certain residential and mixed-use development and for land acquisition related to redevelopment or public projects (Mathur and Smith, 2012; Portland Development Commission, 2015). Portland has used TIF within five URAs to finance between 12% and 53% of the streetcar capital projects. TIF has provided approximately 20% of the capital funding across all five streetcar phases.

Although TIF has been the subject of legal challenges in other states and jurisdictions, the Portland streetcar projects have not experienced these problems. State legislation clearly

authorizes TIF for the purposes for which it has been used, and the projects enjoy broad popular support. It may be noteworthy that the TIF component of capital funding was not used to purchase streetcar rolling stock given the fact that the cars travel between, and in and out of, individual URA (TIF) districts, and TIF financed capital expenditures are limited to within districts where funds were realized. Initiatives to allow cross-district or inter-district cooperative TIF projects have been proposed elsewhere, such as SIFT within the Commonwealth of Massachusetts.

VI Business Case

The City of Portland attributed developers' confidence in the value creation potential of the streetcar, combined with willingness of developers and property owners to accept LID assessments, as two of the three main factors underpinning the success of the project (Mathur and Smith, 2012). The third factor was the public's perception of the positive impacts of the streetcar and TOD, including rapid value creation through development.

The City of Portland used multiple strategies to build a market-friendly business case for the streetcar. One such strategy was based on increasing the market value of property through density increases. The PDC allowed density increases for a 40-acre brownfield property in the heart of the River District through a master development agreement. The master development agreement with the property owners, Hoyt Street Properties, tied densities to public improvements. For example, the minimum required housing density increased incrementally from 15 to 87 units per acre when the Lovejoy Viaduct was deconstructed. Density increased again to 109 units per acre when the streetcar construction commenced, and increased again to 131 units per acre when the first neighborhood park was built. The developer has stated that without the streetcar and the accessibility it provides, these densities would not have been possible (Adams, 2008).

Another element of Portland's market-sensitive strategy was to keep costs low. The system was expressly designed for cost-effectiveness, both in development and operation. PSI's design criteria included:

- Use of preexisting rights-of-way;
- Limiting investment in new facilities and infrastructure to just the essentials;
- Using commercially available off-the-shelf equipment where possible;
- Operating the system operation safely but on a no-frills basis; and
- Minimizing construction costs by avoiding costly utility and roadway relocation and developing bus stop–like station facilities (Adams, 2008).

PSI selected Czech Republic–manufactured streetcars that are 8 ft wide and 66 ft long. The scale of the cars allowed them to operate at grade in mixed traffic within conventional street rights-of-way.

VII Creditworthiness, Finance, and Funding

The first phases of the Portland streetcar system involved no federal funding. Private initiative and civic leadership were central to project viability and success. Where any of the various value capture revenue stream was used to service bonded indebtedness, the city's full faith and credit was required to guarantee those bonds (Personal communication, 2016).

VIII Funding

Major funding sources for the five phases of Portland's streetcar system are identified in Table 19. The five streetcar segments are defined as:

- Phase I: Legacy Good Samaritan Hospital (LGSH) to Portland State University (PSU);
- Phase II: PSU to River Place (RP);
- Phase III: RP to SW Gibbs Street (SWGS);
- Phase IV: SW Moody and Gibbs (SWM/G) to SW Lowell (SWL); and
- Phase V: Pearl District (PD) to the Oregon Museum of Science and Industry (OMSI).

Table 19. Portland streetcar major funding sources by phase.

Segment	LGSH to PSU	PSU to RP	RP to SWGS	SWM/G to SWL	PD to OMSI	Total
Length (miles)	2.4	0.6	0.6	0.4	3.35	7.35
Year of Service	2001	2005	2006	2007	2012	
Parking bonds	$28.60					$28.60
SAD (LID)	$9.60	$3.00	$2.00	$4.80	$15.50	$34.90
TIF (URA)	$7.50	$8.40	$3.80	$1.80	$27.68	$49.18
FTA	$5.00				$75.00	$80.00
Parking bonds	50.26%					11.38%
SAD (LID)	16.87%	18.75%	12.66%	33.22%	10.45%	13.88%
TIF (URA)	13.18%	52.50%	24.05%	12.46%	18.67%	19.56%
FTA	8.79%				50.58%	31.82%
Total (millions)	$56.90	$16.00	$15.80	$14.45	$148.27	$251.42

Notes: Funding sources for smaller project elements are excluded. Dollar figures do not sum to project totals.

Table 20 shows that it took over 15 years to complete the project.

IX Additional Considerations

The great success of Portland's streetcar system has revealed a variety of unexpected tensions. At the outset, private property interests recognized that they had to contribute significantly to finance the first phase of the streetcar in order to get it built. As additions to the successful streetcar system have come to be seen as near certainties, private interests increasingly negotiate to shift financial burden to the public sector. On the public policy side, greater awareness has developed regarding residential and commercial displacement, unresolved workforce and affordable housing issues, the nature and extent of transit-induced value creation, and the economic potential for value capture. Each of these now influence ongoing policy debates.

Table 20. Portland streetcar timeline.

Project Stage	Date	Years from Central City Plan
Portland Central City Plan	1988	N/A
Streetcar feasibility study	1990	2
Streetcar Citizens Advisory Committee	1990	2
Preliminary engineering	1994	6
Request for bids	1996	8
Federal funding commitment	1996	8
TriMet commitment	1996	8
Portland city council funding commitment	1997	9
Contracts let for rail and construction	1998	10
Contract let for acquisition of streetcars	1999	11
Groundbreaking: Phase I	1999	11
Commencement of service: Phase I	2001	13
Groundbreaking: Phase II	2004	16
Commencement of service: Phase II	2005	17
Groundbreaking: Phase III	2005	17
Commencement of service: Phase III	2006	18
Groundbreaking: Phase IV	2006	18
Commencement of service: Phase IV	2007	19
Groundbreaking: Phase V	2009	21
Commencement of service: Phase V	2012	24

In some cases, property owners who contributed through assessments toward initial streetcar system development are now disappointed, even angry, that their particular station is being closed or relocated due to evolving program and operational decisions. At the same time, some philosophical tension has developed between planners and policy makers focused on providing transit service to existing or preexisting populations and those focused on inducement of new development and ridership (Personal communication, 2016).

The streetcar system's many economic successes have engendered competition over prospective revenue sources. Different agencies and departments of government realize revenue differently and from different sources. Transit agency planners wonder why so much financial benefit accrues to other agencies while value creating transit remains subject to scarce resources. Some perceive an increasing tendency for value capture–generated revenue to find its way into the general fund or to otherwise fund aspects of urban renewal largely unrelated to transportation infrastructure (Personal communication, 2016). Even within the sphere of transit investment and operation, there is some tension regarding which funding sources and mechanisms are appropriate for operating costs and which for capital costs.

X Takeaways

This case study demonstrates the application of transit value capture mechanisms that can be applicable to all transit and rail modes; however, it is probably most relevant to streetcar, light rail, and bus rapid transit projects. Important takeaways include:

- **Rigorous Plan:** The Portland streetcar provides an exemplary demonstration of how rigorous cost discipline, strategic public–private partnership, high-quality TOD, and creative combination of value capture and other funding mechanisms can contribute to transformative value creation and economic development. The project incorporates multiple value capture methodologies, including TIF and SAD in particular. Context-appropriate technology selection and rigorous cost discipline allowed project feasibility with a strong role of local funding, with more than one-third of the total capital costs funded through TIF and SAD, 19.6% and 13.9%, respectively.
- **Early Engagement:** Early engagement and strategic partnership between public and private-sector interests resulted in an alignment of policies successful in achieving common goals addressing both public and private ends. Specific policies included accommodation of TIF and SAD design and implementation; land use regulation, zoning, and development standards; fiscal incentives; and both public and private investment in a variety of urban amenities.
- **Private Involvement:** Private-sector initiative and engagement were crucial for the project's success. The P3 was effective in achieving financial, political, and public support and credibility.
- **Value of Agreements:** From a political standpoint, the ability to point to an agreement with joint obligations on the part of respective public and private partners carried substantial clout and provided dependability and flexibility that both parties could rely upon (Adams, 2008).
- **Timing:** Commencement of service required more than 10 years from initial planning even with extensive public and private support.
- **Flexibility:** Line-/segment-specific flexibility in structuring TIF and special assessments optimized funding opportunities. Even within contiguous TOD areas, value capture was not a one-size-fits-all proposition.
- **Infrastructure Permanence:** The fixed-rail nature of the streetcar system induced confidence on the part of landowners, investors, and developers because it was "perceived as a permanent commitment of the city" as opposed to the route design flexibility of buses or other non–fixed-guideway technologies (Ramos, Brown, and Nixon, 2015).

APPENDIX G

Dulles Metrorail, Washington, D.C.

I Overview and Description

The Dulles Metrorail Corridor Project, also known as the Silver Line, is a 23-mile extension of the Washington, D.C., region's Metrorail system. The project is being designed and built in two phases by the Metropolitan Washington Airports Authority (MWAA). Phase 1 consists of 11.7 miles of rail and five stations, connecting some of the D.C. region's largest employment centers with downtown Washington, D.C. Phase 2 will add 11.4 miles of rail and six stations, including a station at Dulles International Airport (IAD). Now operational since July 2014, Phase 1 has been transferred to the Washington Metropolitan Area Transit Authority (WMATA), and that phase is known known as the Silver Line, a designation that will also apply to Phase 2. Figure 33 shows a map of the project. In total, the project will increase the track miles of the Metro system by over 20%. Value capture sources have funded approximately one-fifth of the project.

The original funding plan was based on the federal government paying for about half of the costs. Grants from the FTA would pay 50% of the entire project (i.e., both Phases 1 and 2), the Commonwealth of Virginia/MWAA would pay (through grants and Dulles Toll Road toll revenues) 25%, and local governments would pay the final 25%. Those percentages were subsequently revised as the costs increased while the federal dollar amount remained constant at $900 million, causing the other percentages to increase respectively (Fairfax County, 2016b).

Combined, the two phases of the project, totaling $5.7 billion, will have been funded with a combination of tolls, commercial tax districts, and state and federal grants, as shown in Table 21.

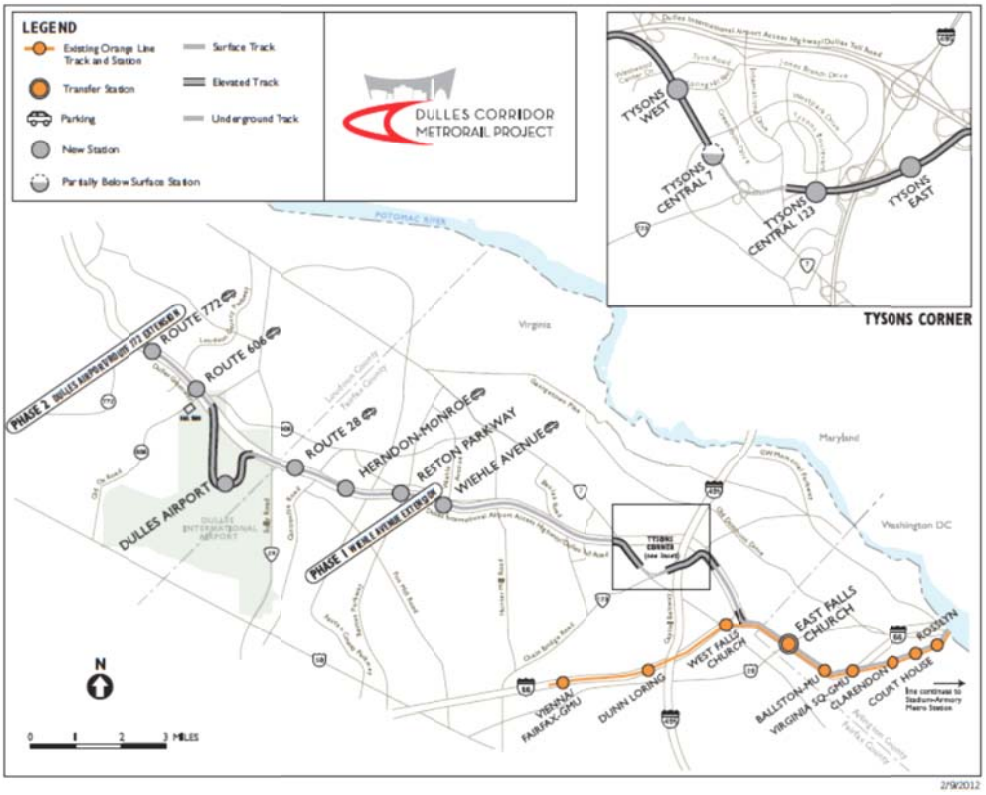
The local funding responsibility was allocated as follows:

- Fairfax County, 16.1%;
- Loudon County, 4.8%; and
- MWAA, 4.1%.

This case study focuses in particular on the contribution of the first of Fairfax County's two Transportation Improvement Districts (Phase 1 TID), which produced the majority of the value capture funding. The Phase 1 TID set the precedent for the Phase 2 TID and the Loudoun tax district.

Fairfax County's total 16.1% share of the project is estimated to be approximately $915 million, which will be finalized once Phase 2 is complete in 2019. Fairfax County is expected to contribute the following:

- **Phase 1**: $400 million would be funded from the Phase 1 tax district.
- **Phase 2**: $515 million would come from the following future sources:
  - $330 million from the Phase 2 tax district, and
  - $185 million supported by proceeds from the TIFIA loan that will be repaid using the county's commercial and industrial real estate tax and regional funds from the Northern Virginia Transportation Authority (NVTA) (Fairfax County, 2016b).



Source: Dulles Corridor Metrorail Project, 2015.
Figure 33. Dulles Metrorail project map.

Table 21. Dulles Metrorail funding.

Sources of Capital/Funds	Phase 1	Phase 2	Rail Project Budget		TIFIA Loan
			Total	% of Total	
Federal	$900	–	$900[1]	15.8%	
Commonwealth of Virginia	$252	$323	$575[1]	10.1%	
Fairfax County	$400	$515	$915	16.1%[2]	$403
Loudon County	–	$273	$273	4.8%[2]	$195
MWAA (aviation funds)	–	$233	$233	4.1%[2]	–
MWAA (Dulles Toll Road)	$1,354	$14,34	$2,788	49.0%[3]	$1,277
Total sources of funds	**$2906**	**$2,778**	**$5,684**	**100.0%**	**$1,876 (33% of total)**

[1]Fixed amount; [2]Fixed percentage of total cost, [3]Residual.
Source: Dulles Corridor Metrorail Project, 2015.

II Local Economic Conditions and Market Considerations

The Dulles Corridor is part of the Washington, D.C., region in which a key portion of the region's economic activity occurs. This includes Tysons Corner, with approximately 37 million ft^2 of office, commercial, and retail space and five Fortune 500 companies; the Reston–Herndon area, a growing office area; and other properties along the Dulles Corridor leading to the Dulles Airport (Fitch Ratings, 2016b).

The D.C. region has benefitted from the growth of the federal government and ancillary businesses, including aerospace, information technology, and telecommunications businesses. As Table 22 shows, the assessed value of the taxable commercial and industrial properties in the Phase 1 TID essentially doubled from 2001 to 2010 (from $5.0 billion to 12.4 billion) and grew at a compounded annual growth rate of 4.6% from 1985 to 2016. This growth occurred despite several major real estate cycle downturns and federal government budget sequestration cuts that reduced jobs at government defense and other contractors located on the Dulles Corridor (Fairfax County Economic Development Authority, 2016).

Projections show that the over the next 25 years, the Tysons area population within the corridor is expected to grow by 45% and employment by 63% (Metropolitan Planning Council, 2016).

III Capacity, Organization, Coordination, and Partnership

Dulles Metrorail planning and organization are complex and extend back decades to the creation of IAD. The Dulles Metrorail, or a form of it not necessarily on the same alignment, was originally considered as part of IAD but could not be realized for several decades due to lack of funding at the local or Commonwealth of Virginia level (Dugan, 2014).

One of the primary initiatives that advanced the Dulles Metrorail project was undertaken by a group of developers within the corridor who agreed to fund a portion of the local share of the project through special district tax financing. The group was called the Landowners Economic Alliance for the Dulles Extension of Rail (LEADER) and comprised the early landowners of Tysons Corner, including owners of the West Group and Lerner Enterprises. This group began to evaluate the possibility of rail connection to Tysons as early as the 1980s, putting money into planning studies. The work continued through several recessions in the 1980s and 1990s (Personal communication, 2016; Dugan, 2014).

Table 22. Assessed value of taxable commercial/industrial property in Phase 1 TID[1].

Fiscal Year	Amount (Billions)	% Change	Tax Rate (Per $100 of Assessed Value)
1985	$3.1	N/A	N/A
1990	$4.1	33.3%	N/A
1995	$3.4	(16.3%)	N/A
2000	$5.0	45.5%	N/A
2001	$5.6	12.4%	N/A
2002	$6.3	12.5%	N/A
2003	$6.7	4.9%	N/A

2004	$6.6	(0.6%)	N/A
2005	$6.8	3.3%	0.22
2006	$8.1	18.3%	0.22
2007	$10.0	23.7%	0.22
2008	$11.6	16.4%	0.22
2009	$12.8	10.2%	0.22
2010	$12.4	(3.0%)	0.22
2011	$10.0	(20.0%)	0.22
2012	$10.2	1.7%	0.22
2013	$11.1	9.5%	0.22
2014	$11.3	1.9%	0.21
2015	$11.6	1.9%	0.21
2016	$11.9	3.1%	0.19

[1]The TID was established in February 2004. The table provides prior year information for property that now falls within the TID boundaries.

Source: Fairfax County Economic Development Authority, 2016.

LEADER's efforts to sign up owners of at least 50% of the assessed value in the Phase 1 TID gathered momentum in the late 1990s and into the early part of the 2000s. Convincing large landowners and leaseholders such as Mitre Corporation and Northrop Grumman to support the effort was not difficult since they understood the benefit of providing employees and visitors alternative transportation options in an increasingly congested corridor. Convincing smaller landowners was more difficult. Many of the smaller property owners owned or leased to small retail operations such as gas stations, strip malls, and auto dealers who did not necessarily recognize the benefit of the Phase 1 TID or were simply not interested in participating in the process. Some developers had long-term leases with major corporations that had to be convinced to accept the higher Phase 1 taxes that would be passed through in the lease (Personal communication, 2016).

LEADER spent much time and effort holding meetings and hiring well-known Virginia politicians such as Chuck Robb and Linwood Holton to help convince the remaining landowners (Personal communication, 2016), which ultimately proved successful.

The Phase 2 TID format followed a similar legal structure as Phase 1. That effort initially failed to win 50% of the landowners because the City of Herndon would not join the TID. Part of Herndon's concern was that its businesses would be supporting benefits to Tysons-area competitors while the Phase 2 project was delayed.

Table 23 illustrates the complex nature of the project, involving two transportation agencies, two county governments, the Commonwealth of Virginia, and the federal government providing funding, financing, and negotiation participation.

IV Master Planning, Zoning, and Other Regulatory Considerations

Dulles Metrorail stakeholders initiated a variety of planning changes following the Phase 1 TID formation in order to allow a denser, urban-like fabric around the Dulles Metrorail stations within

the Phase 1 and Phase 2 TIDs. Many of these changes are expected to benefit landowners affected by the TID special assessments.

Table 23. Principal project participants focused on value capture.

Partner	Role
WMATA	Transit agency responsible for Phase 1 and Phase 2 operations
MWAA	Airport authority overseeing project construction
Fairfax County, Loudon County	Local governments that established special districts for value capture
Commonwealth of Virginia	Enacted legislation allowing for special districts and provided grant funding
LEADER	Private development group, advocated for project and helped to organize the Phase 1 TID
U.S. DOT	The FTA provided New Starts grant and loan to finance Phase 2 of project; U.S. DOT Secretary LaHood also played role in bringing Phase 2 partners together.

In 2010, Fairfax County adopted a Comprehensive Plan for Tysons (Tysons plan). Concurrently, Fairfax County adopted a zoning ordinance amendment establishing a new zoning district called the Planned Tysons Corner PTC Urban District. These were related to a number of transportation initiatives, including design of an urban street grid, reengineering of major intersections, and implementation of a bike share program (Fairfax County Economic Development Authority, 2016).

In addition, in 2011 Fairfax County created a not-for-profit with private participants called Tysons Partnership that provided a comprehensive approach to marketing and branding, transportation, urban design/planning, public facilities, community amenities, and finance (Fairfax County Economic Development Authority, 2016).

Securing the funding of Dulles Rail was a prerequisite for the Tysons Comprehensive Plan to be enacted. Since the adoption of the Tysons plan, 15 major redevelopment proposals have been approved or are pending approval within Tysons. These projects, and six rail-related projects approved prior to the plan, are primarily located within a quarter mile of a Metrorail station and represent 61 million ft^2 of development (Fairfax County Economic Development Authority, 2016).

Fairfax County initiated similar planning changes under a comprehensive plan amendment affecting the Wiehle Avenue station and two other Metrorail stations that were part of the Phase 2 TID, as well as similar planning of a street grid, bike share, and new overpasses. For the Wiehle Avenue station area, a number of zoning cases are under review that could add approximately 4 million ft^2 of mixed-use development (Fairfax County Economic Development Authority, 2016).

At issue for some landowners is that the Tysons plan imposes additional fees, including Tysons Service District rates of $0.06 per $100 of assessed value (AV) (Fairfax County, 2016c). As Tysons continues to increase in density over the next 30 years, these rates will remain in place. The additional $0.19 Phase 1 TID tax increased the base tax rate by 22%, not including other tax costs such as for storm water, leaf collection, and water that are assessed in certain parts of Fairfax County. While this could present a competitive disadvantage, developers' representatives believe that competing locations throughout the Washington, D.C., region have similar all-in tax

burdens and the strong development at Tysons over the past 5 years suggests that tax rates have not been obstructive (Personal communication, 2016).

V Legal Steps

V.A Phase 1 TID

Fairfax County's obligation to fund the $5.7 billion project was 16.1%, or $400 million for Phase 1 and $515 million for Phase 2 (Fairfax County, 2016a). Fairfax County established a special tax district on commercial and industrial properties in 2004 to fund the county's portion of the Phase 1 TID. The Phase 1 TID consisted of most of the Tysons Corner Urban Center and an area around the Phase 1 stations, as shown in Figure 34.

The Phase 1 TID was authorized by Chapter 15 of Title 33.1 of the Code of Virginia (the act). Commercial and industrial property within the TID created pursuant to the act can be taxed to raise funds for transportation improvements in the TID. Such a district can be created upon the petition of the owners of at least 51%, measured by land area or assessed value, of the real property located within the proposed district that is zoned or used for commercial or industrial purposes. The properties in the petition constituted over 64% of such property located within the Phase 1 TID, measured by assessed value (Fairfax County, 2016a).

Per the Code of Virginia §33.1-435, properties zoned to permit multi-unit residential use but not yet used for that purpose and multi-unit properties primarily leased or rented to residential tenants or other occupants by an owner who is engaged in such a business are deemed to be in commercial use for purposes of the act. No other residential properties are subject to any tax that may be levied on behalf of such a district, even if they are within the boundaries of such a district (Fairfax County, 2016a).

Phase 1 TID allows a tax level of up to $0.40 per $100 of assessed fair market value. However, under the terms of the petition, the Fairfax Board of Supervisors cannot adopt a plan of finance that would be reasonably anticipated to require a tax greater than $0.29 per $100 of AV, assuming growth in AV of 1.5%; this is a political but not a legal obligation (Fairfax County Economic Development Authority, 2016). The most recent tax rate is $0.19 per $100 of assessed value (Fairfax County, 2016a).

The Phase 1 TID financing does not obligate the commonwealth or Fairfax County to impose the annual special improvements tax or to levy taxes. It is truly "non-recourse" to the county (Fairfax County Economic Development Authority, 2016).

V.B Phase 2 TID

Fairfax County's obligation for Phase 2 of the Dulles Metrorail project was $515 million, funded differently than Phase 1. The Phase 2 TID was expected to raise $330 million. The remaining amount of $185 million was to be supported by proceeds from the TIFIA loan that will be repaid using the county's commercial and industrial real estate tax and regional funds from NVTA (Fairfax County, 2016b). Fairfax County received the petition to form the Phase 2 TID in 2009, the county approved the TID at the end of 2009.

The Phase 2 TID tax rate was set at the end of 2009 at $0.05 per $100 and increased 5¢ each year to $0.20 per $100 in FY 2014. The Phase 2 TID can be as high as $0.25/$100 of assessed

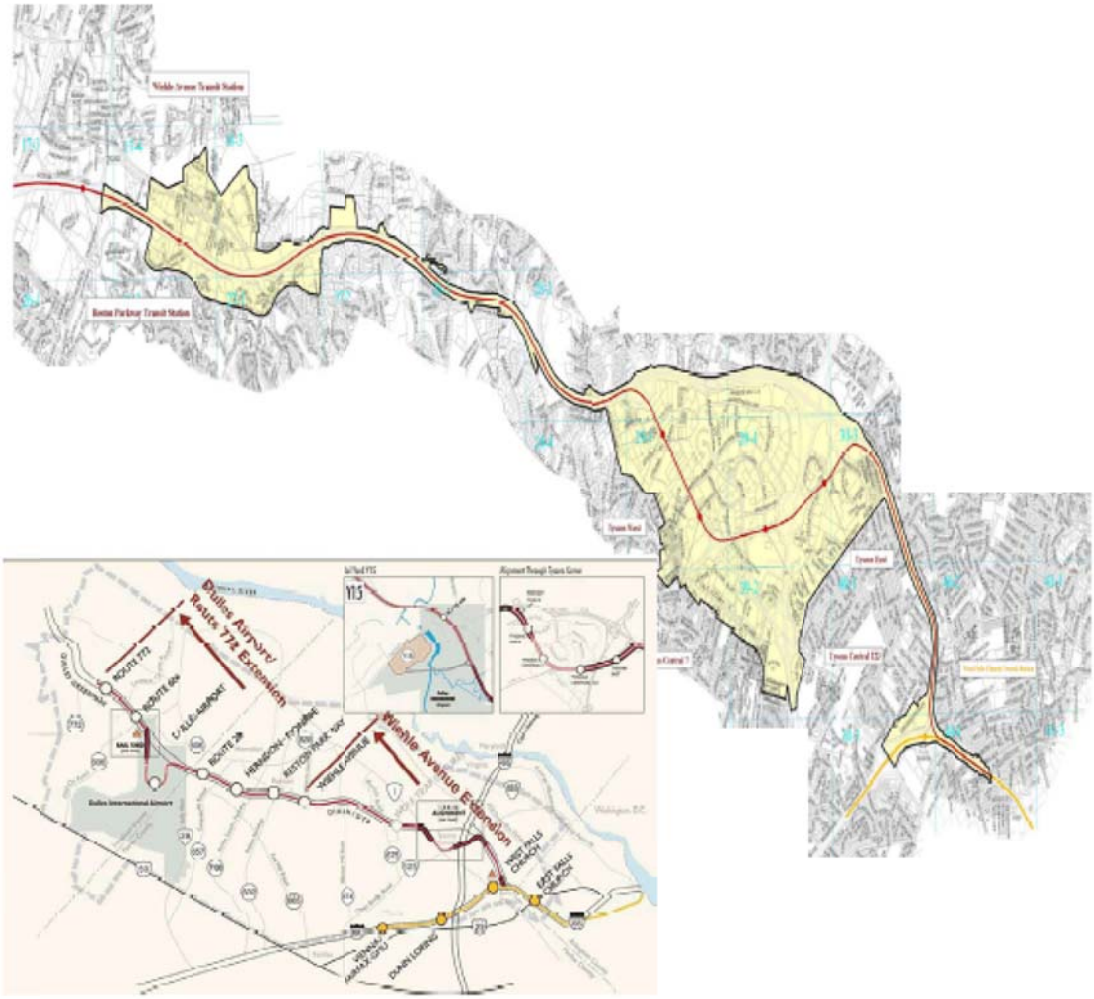
value, depending on financing needs, which in total are $40 million of a TIFIA loan to fund Fairfax County's Phase 2 obligations (Fairfax County Economic Development Authority, 2016).

Table 24. Dulles Metrorail timeline, focusing on value capture.

Project Stage	Year
The FAA recommends reservation of the median of the Dulles International Airport Access Highway for a future transit line.	1964
Dulles Access Rapid Transit sponsors a study for a transit line to IAD and raising funds through assessments.	1985
The Virginia General Assembly permits creation of special taxing districts to fund transportation along Route 28.	1988
The FTA announces that due to funding limitations, the project cannot be funded as a single project.	2002
The City of Herndon turns down participation in special tax district due to concern that its businesses would support a project benefitting Tysons-area competitors while the Phase 2 project was delayed.	2003
Landowners submit Phase 1 TID petition.	2003
Fairfax County establishes Phase 1 TID.	2004
Fairfax County establishes Phase 2 TID.	2009
Fairfax County adopts the Tysons plan.	2010
MWAA issues $343M of Dulles Toll Road bonds.	2010
Fairfax County issues $206M of Phase 1 TID bonds.	2011
Fairfax County issues $42M of Phase 1 TIDs bonds.	2012
Loudon County creates Metro Service Districts.	2013
WMATA opens Phase 1 line for passenger service.	2014
TIFIA, Fairfax County, and Loudon County close TIFIA loans, in part supported by Fairfax County Phase 2 TID and Loudon County Metro Service Districts.	2014
Phase 2 completion (expected)	2019

Source: Dulles Corridor Metrorail Project, 2015.

Unlike the Phase 1 TID, the Phase 2 TID revenues are not pledged to the TIFIA loan. Instead, the county commits to use Phase 2 TID revenues plus the NVTA funds to repay the loan. There is, however, no legal obligation to appropriate those monies, nor is there a direct obligation to repay the loan with Fairfax County taxes (Fairfax County Economic Development Authority, 2016).



Source: Fairfax County Economic Development Authority, 2016.
Figure 34. Phase 1 TID map.

VI Loudoun County Special Tax District

VI.A TID

Loudoun County created a special tax district, the Metrorail Service District, to pay for its portion of Phase 2 of the project. The TID consists of properties around the Phase 2 Loudon County stations. The levy within the TID is $0.20 per $100 of value (APTA, 2015).

VI.B Garages

In order to manage Dulles Metrorail's Phase 2 costs, the planned Phase 2 parking garages in Fairfax and Loudon Counties were made to be the separate project delivery and financial responsibility of those counties. Fairfax County is responsible for the garages at Herndon and

Innovation Center stations and Loudoun County is responsible for the garages at the Route 606 and Route 772 stations. In Fairfax County, these stations are financed with TIFIA loans and funded with parking revenues and county credit (Fairfax County Economic Development Authority, 2016).

VII Business Case

As shown in Table 21, special tax revenues collected by the Phase 1 TID have grown steadily from 2011 onward, reflecting strong asset valuations as well as a slight decrease in tax rate from $0.22 in 2012 to $0.19 in 2016 (Fairfax County Economic Development Authority, 2016).

VIII Creditworthiness, Finance, and Funding

The Phase 1 TID bonds were rated "AA," "Aa1," and "AA" by Fitch, Moody's, and Standard & Poor's, respectively (Fairfax County Economic Development Authority, 2016).

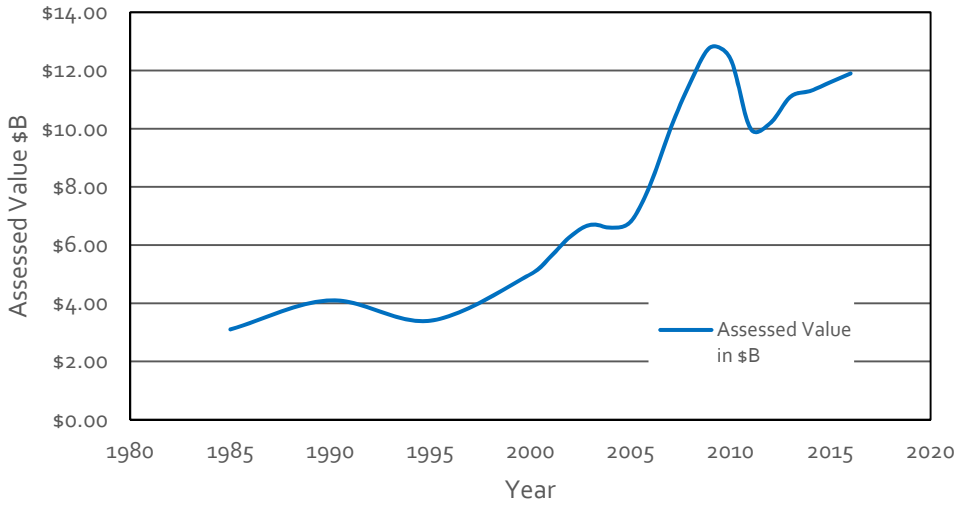
Key strengths of these bonds according to Fitch Ratings were:

- Good coverage and liquidity of 1.45 maximum annual debt service and 3.1x ratio at the maximum legal rate;
- County target of a minimum coverage ratio of 1.5x;
- Tax rate flexibility, allowing the rate to change to maintain revenue at a sufficient level to cover debt service; and
- Strong but concentrated tax base: Phase 1 TID includes corporate headquarters of five Fortune 500 companies and growing assessed valuation (Fitch Ratings, 2016).

IX Takeaways

The Dulles Metrorail project, combining Phases 1 and 2, is one of the largest single transit rail projects and value capture efforts in the United States undertaken in the past two decades. As with all projects, there are a number of unique elements, yet several elements are typical of large projects and their respective value capture issues. These include:

- **Growing Market:** The project was located in a high-growth-rate corridor in an expanding region. Phase 1 TID assessed value increased healthily over the previous two decades. This relative prosperity motivated private landowners and gave local and state policy makers confidence in the project.
- **Committed Public and Private Participants:** Numerous public and private participants were committed to the project for years, overcoming a variety of challenges including questions about alignment, planning delays, debates about costs of project elements (such as tunnels), interregional differences, and federal funding limitations. For value capture, developers such as those initiating the Phase 1 TID were highly committed for two decades in their advocacy and resources for studies, legal costs, and paid spokespeople. This advocacy continued through economic downturns, which in retrospect appear to be small blips in the time series, as shown in Figure 35, but at the time severely challenged a number of businesses advocating for the project.



Source: Fairfax County Economic Development Authority,2016.

Figure 35. Assessed value of taxable commercial/industrial property in the Phase 1 TID.

- **Meaningful Planning:** The Tysons plan and similar planning throughout the corridor reflected the transportation impacts of Dulles Metrorail—fostering a denser, more pedestrian-oriented area. It also allowed developers to further leverage their landholdings, justifying their early investment in advocating for the project and setting up the TIDs.
- **Managing Value Capture Burden:** It will take a decade or more to truly assess the benefits/costs of the TIDs and their impact on land values. Based on the available anecdotal evidence, the increased assessments in Fairfax and Loudoun Counties do not appear excessive and are reportedly not creating a competitive disadvantage for developers. Nevertheless, obtaining agreement on special assessments among smaller landholders was a challenge given their relative indifference toward the project.
- **Phasing Flexibility:** The project and the value capture effort underwent several phases, including splitting the project into two phases and dividing the Fairfax County TID in two. The project and the value capture participants nimbly responded to these changes.

APPENDIX H

Interviews

I Demographics of Interview Participants

In total, the project team interviewed 20 individuals for the purpose of this guide. Participants were selected based on their experience with and knowledge of a case study project. To supplement information in this guide, the project team also interviewed individuals with expertise in value capture from the perspective of a ratings agency. Table 25 shows the interview participants for this guide and the types of organizations that they represented. All interviews were conducted on a confidential basis, and information received from interviews was not attributed to specific individuals.

Table 25. Interview participants.

Project	Organization	Type Of Organization
Boston Landing Station	Regional transit authority	Public
Boston Landing Station	Developer	Private sponsor
Denver Union Station	Outside counsel	Private partner
Denver Union Station	Engineering firm	Private partner
Denver Union Station	Developer	Private
Denver Union Station	Regional transit authority	Public
Denver Union Station	City and County of Denver	Public
Kansas City Streetcar	City of Kansas City, MO	Public
Kansas City Streetcar	Developer	Private
Kansas City Streetcar	Outside counsel	Private partner
Overall	Transit agency	Public
Overall	Investment bank	Public finance and banking
Overall	Moody's	Rating agency
Portland Streetcar	Nonprofit authority	Nonprofit
Portland Streetcar	Developer	Private
WMATA Silver Line	WMATA	Public
WMATA Silver Line	Developer	Private
WMATA Silver Line	Local county	Public
WMATA Silver Line	Developer	Private
WMATA Silver Line	Local county finance	Public

II Interview Questions

The interview questions and discussion topics presented below were the starting point for our conversations with interviewees. Depending on the specific knowledge and experience of the individual, precise questions differed.

1) Interviewee/respondent background
a) Name, title, responsibilities, background, time at post
b) Involvement with project
2) Project background
a) What made your organization (transit agency, local government, or developer) interested in the project?
b) What were the key decision criteria for your organization?
   i) Capturing/inducing transit ridership
   ii) Serving existing commuters/predevelopment residential/employment patterns
   iii) Serving post-development residents/workers drawn to new development/TOD
   iv) Relieving roadway congestion
   v) Economic development strategy
   vi) Real estate development within a corridor/TOD near station sites
   vii) Project funding and financing
   viii) Growth management or other public policy mandates or objectives
   ix) Other (political, environmental)
3) Value capture
a) How were value capture strategies incorporated into the project?
   i) Strategic partnership
   ii) Cooperative planning, zoning, entitlement efforts
   iii) Land acquisition or other real estate strategies
   iv) Identify successes, innovations, impediments
   v) Financing
b) How important were value capture solutions in the completion of the project?
4) What were your greatest challenges related to the project?
a) Compliance
b) Procurement
c) Design
d) Timing
e) Financing
5) What do you perceive to be the greatest barriers to multiparty partnerships?
a) How did you overcome these barriers?
6) What were the greatest lessons learned?
7) Do you have any suggestions for implementing future value capture–related TOD projects?

Acronyms and Abbreviations

AV	Assessed Value
BMJD	Bethesda Metro Joint Development
BRT	Bus Rapid Transit
CBD	Central Business District
CBRE	Commercial Real Estate Services, Worldwide
CCD	City and County of Denver
CDD	Community Development District
CDOT	Colorado Department of Transportation
CMAQ	Congestion Mitigation and Air Quality
DDA	Denver Downtown Development Authority
DRCOG	Denver Regional Council of Governments
DUS	Denver Union Station
DUSPA	Denver Union Station Project Authority
FAST Act	Fixing America's Surface Transportation Act
HKSAR	Hong Kong Special Administrative Region
IGA	Intergovernmental Agreement
KCMO	Kansas City, Missouri
KCSA	Kansas City Streetcar Authority
LEADER	Landowners Economic Alliance for the Dulles Extension of Rail
LID	Local Improvement District
LRT	Light Rail Transit
MassDOT	Massachusetts Department of Transportation
MBTA	Massachusetts Bay Transportation Authority
MTR	Mass Transit Railway
MTRC	Mass Transit Railway Corporation
MWAA	Metropolitan Washington Airports Authority
NEPA	National Environmental Policy Act
NVTA	Northern Virginia Transportation Authority
P3	Public–Private Partnership
PDC	Portland Development Commission
PSI	Portland Streetcar, Inc.
RFQ	Request for Qualifications

RRIF	Railroad Rehabilitation and Improvement Financing
RTD	Regional Transportation District
S&P	Standard and Poor's
STP	Surface Transportation Program
TDD	Transportation Development District
TID	Transportation Improvement District
TIF	Tax Increment Financing
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery
TOD	Transit-Oriented Development
TriMet	Tri-County Metropolitan Transportation District
URA	Urban Renewal Area
USAC	Union Station Advisory Committee
USNC	Union Station Neighborhood Committee
WMATA	Washington Metropolitan Area Transit Authority

References

Adams, S. (2008). Portland Streetcar Development Oriented Transit. Office of Transportation, Portland, Oregon, and Portland Streetcar, Inc.

Alexander, E. R. (2012). Institutional Design for Value Capture and a Case: The Tel-Aviv Metropolitan Park. International Planning Studies, 17(2), 163–177.

All Aboard Florida. (2016). Passenger Train Travel. Retrieved on 1/24/2016 from www.allaboardflorida.com.

APTA. (2009). Defining Transit Areas of Influence.

APTA. (2015a). *Public Transportation Fact Book*. Retrieved from www.apta.com/resources/statistics/Documents/FactBook/2015-APTA-Fact-Book.pdf.

APTA. (2015b). APTA Ridership. Retrieved from www.apta.com/resources/statistics/Pages/ridershipreport.aspx.

Arts, J., Hanekamp, T., and Dijkstra, A. (2014). Integrating Land-Use and Transport Infrastructure Planning: Towards Adaptive and Sustainable Transport Infrastructure. Paper presented at the Transport Research Arena (TRA) 5th Conference: Transport Solutions from Research to Deployment.

Bachels, M., and Newman, P. (2011). Reducing Overall Travel: Transit Oriented Development. In R. a. D. Salter, S. and P. Newman (Eds.), Description of Concrete Mitigation Technologies and Practices in the Transport Sector: Roskilde, Denmark: UNEP Riso Centre.

Barrett, D. (2014). Denver Union Station: $500M Public Transportation Infrastructure Project with 5 Public/Private Partners, and 9 Financing Sources. Retrieved on 1/29/2016 from: www.law.du.edu/documents/rmlui/conference/powerpoints/2013/Barrett-Diane-Public-Private-Paternship-Case-Study-Denver-Union-Station.pdf.

Boschken, H. L. (2000). Behavior of Urban Public Authorities Operating in Competitive Markets Policy Outcomes in Mass Transit. *Administration & Society*, 31(6), 726–758.

Boston Redevelopment Authority. (2012). Brighton: Guest Street Area Planning Study, March 2012. Retrieved on 5/21/2016 from www.bostonredevelopmentauthority.org/getattachment/dc935a9c-f754-492c-a07b-baa22f912037.

Boston Redevelopment Authority. (2015). Boston Landing PDA No. 87 – 4th Amendment to Master Plan 2015-06-26. Retrieved on 5/21/2016 from www.bostonredevelopmentauthority.org/projects/development-projects/boston-landing.

Brown, K. (2007). Are Public–Private Transactions the Future of Infrastructure Finance? *Public Works Management & Policy*, 12(1), 320–324.

Brown, J., Nixon, H., and Ramos, E. (2015). The Purpose, Function, and Performance of Streetcar Transit in the Modern U.S. City: A Multiple-Case-Study Investigation.

Carlton, I. (2009). Transit Infrastructure Finance Through Station Location Auctions. Berkeley Institute of Urban and Regional Development. Working Paper 2009-004.

Case, B., and Wachter, S. (2005). Residential Real Estate Price Indices as Financial Soundness Indicators: Methodological Issues. In Residential Indicators and Financial Stability, BIS Paper No. 21, pp. 197–211. Washington, D.C.: Bank for International Settlements.

CBRE. (2009). Absorption Feasibility and Site Specific Property and Sales Taxes Analysis for Denver D.D.A. and Denver Union Station Project, City and County of Denver, Colorado: Submitted to City and County of Denver, September 2009 Update. October 15, 2009.

Cervero, R., Murphy, S., Ferrell, C., Goguts, N., Tsai, Y.-H., Arrington, G. B., Boroski, J. Smith-Heimer, J., Golem, R., Peninger, P., Nakajima, E., Chui, E., Dunphy, R., Myers, M., McKay, S., and Witenstein, N. (2004). *TCRP Report 102: Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects*. Transportation Research Board of the National Academies, Washington, D.C.

Cervero, R., and Murakami, J. (2008a). Rail and Property Development in Hong Kong: Experiences, Impacts, and Extensions. *Urban Studies*, 46(10), 2019–2043.

Cervero, R., and Murakami, J. (2008b). Rail + Property Development: A Model of Sustainable Transit Finance and Urbanism. Working Paper. May 2008. UC Berkeley Center for Future Urban Transport.

Cervero, R., and Murakami, J. (2009). Rail and Property Development in Hong Kong: Experiences and Extensions. *Urban Studies*, 46(10), 2019–2043. doi:dx.doi.org/10.1177/0042098009339431.

City of Celina. (2015). Special Assessment Revenue Bonds, (Sutton Fields II Public Improvement District), TX. Official Statement, Dated November 10, 2015. Retrieved on 5/8/2016 from emma.msrb.org/EP890165-EP689245-EP1090956.pdf.

City of Portland Bureau of Transportation. (2009). Portland Streetcar System Concept Plan.

City of Somerville. (2016). Squares and Neighborhoods – Assembly Square. Retrieved on 5/21/2016 from www.somervillema.gov/print/departments/ospcd/squares-and-neighborhoods/assembly-square.

Commonwealth of Massachusetts. (2016). Bill H.4094 189th (Current). An Act Relative to Transportation Infrastructure Value Capture. Retrieved on 5/29/2016 from https://malegislature.gov/Bills/189/House/H4094/History

Connellan, O. (2004). *Land Value Taxation in Britain: Experience and Opportunities.* Cambridge, Massachusetts: Lincoln Institute of Land Policy.

Denver Union Station Project Authority. (2011). Plan of Finance Prepared for Federal Highway Administration TIFIA Joint Program Office, February 1, 2011.

Dittmar, H., and Ohland, G. (2004). The New Transit Town: Best Practices in Transit-Oriented Development: Island Press.

Downtown Council of Kansas City. (2015). Downtown Annual Development Report. Retrieved on 5/20/2016. http://www.downtownkc.org/wp-content/uploads/2015/01/2014_DTC_AR_lowres.pdf.

Dugan, P. (2014). The Silver Line Story: A New Route Is Born After Decades of Faulty Planning, Political Paralysis. Retrieved on 4/13/2016 from www.washingtonpost.com/local/trafficandcommuting/the-silver-line-story-a-new-route-is-born-after-decades-of-faulty-planning-political-paralysis/2014/06/23/bdf619c4-f894-11e3-a606-946fd632f9f1_story.html.

Dulles Corridor Metrorail Project. (2015). Retrieved from www.dullesmetro.com/about-dulles-rail/what-is-dulles-metrorail/.

Fairfax County. (2014). Comprehensive Plan Amendment, Tysons Corner Urban Center, 2014, Amended Through 4-29-2014. Retrieved on 5/12/2016 from www.fairfaxcounty.gov/dpz/comprehensiveplan/area2/tysons1.pdf.

Fairfax County. (2015). Wiehle Avenue Metro Station Garage Wins Public Works Project of the Year Award. Press Release, March 23, 2015. Retrieved on 5/8/2016 from www.fairfaxcounty.gov/dpwes/news/apwa-public-works-project-winners.htm.

Fairfax County. (2016a). Fund 40110: Dulles Rail Phase II Transportation Improvement District. In FY 2017 Fairfax County Advertised Budget Plan (Vol. 2), p. 281 – 285. Retrieved on 4/13/2016 from www.fairfaxcounty.gov/dmb/fy2017/advertised/volume2/40110.pdf.

Fairfax County. (2016b). Fund 40120: Dulles Rail Phase II Transportation Improvement District. In FY 2017 Fairfax County Advertised Budget Plan (Vol. 2), p. 286 – 291. Retrieved on 4/13/2016 from www.fairfaxcounty.gov/dmb/fy2017/advertised/volume2/40120.pdf.

Fairfax County. (2016c). Fairfax County Tax Rates. Real Estate – Tax Rates and Fees: Tax Year 2016. Retrieved on 4/14/2016 from www.fairfaxcounty.gov/dta/realestatetax_taxrates.htm.

Fairfax County Economic Development Authority. (2016). $173, 960,000 Fairfax County Economic Development Authority, Transportation District Improvement Revenue Refunding Bonds (Silver Line Phase I Project), Series 2016.

FHWA. (2013). *Guidebook for Risk Assessment in Public Private Partnerships.* U.S. Department of Transportation, Federal Highway Administration Office of Innovative Project Delivery. Retrieved on 5/14/2016 from: www.fhwa.dot.gov/ipd/pdfs/p3/p3_guidebook_risk_assessment_030314.pdf.

Fitch Ratings. (2015a). Fitch Affirms Denver Union Station Project Authority's (CO) 2010 Senior Notes at "A." November 23, 2015. Retrieved on 4/17/2016 from www.fitchratings.com/site/fitch-home/pressrelease?id=995185.

Fitch Ratings. (2015b). Fitch Affirms Kansas City, Missouri GO & Lease Ratings at "AA" and "A+." Retrieved on 5/20/2016 from https://www.fitchratings.com/site/pressrelease?id=979337 and http://kcmo.gov/news/2013/fitch-affirms-city-ratings/.

Fitch Ratings. (2016a). International Issuer and Credit Rating Scales. Retrieved on 1/24/2016 from www.fitchratings.com/jsp/general/RatingsDefinitions.faces?context=5&context_ln=5&detail=507&detail_ln=500.

Fitch Ratings. (2016b). Fitch Rates Fairfax County, VA Econ. Dev. Auth. Revs "AA"; Outlook Stable. Retrieved on 4/13/2016 from www.businesswire.com/news/home/20160219006017/en/Fitch-Rates-Fairfax-County-VA-Econ.-Dev.

Fitch Ratings. (2016c). U.S. Tax-Supported Rating Criteria, Master Criteria. Retrieved on 5/25/2016 from https://www.fitchratings.com/site/re/879478.

Fogarty, N. A., and America, R. (2008). Capturing the Value of Transit: Center for Transit-Oriented Development. Center for Transit-Oriented Development.

Fogarty, N., and Austin, M. (2011). Rails to Real Estate: Development Patterns Along Three New Transit Lines. Center for Transit-Oriented Development.

FTA. (2009). Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law. Docket No. FTA-2009-0052. Retrieved on 5/14/2016 from https://www.gpo.gov/fdsys/pkg/FR-2011-08-19/pdf/2011-21273.pdf.

FTA. (2014a). Notice of Issuance of Final Circular: Guidance on Joint Development. Washington, D.C.: Federal Transit Administration. Retrieved on 5/21/2016 from:www.fta.dot.gov/documents/FTA_C_7050_1_Guidance_on_Joint_Development_Circular.pdf.

FTA. (2014b). Pilot Program for Transit-Oriented Development (TOD) Planning. Retrieved on 5/8/2016 from www.transit.dot.gov/funding/grants/applying/pilot-program-transit-oriented-development-tod-planning.

FTA. (2015). Recipients for Pilot Program for Transit-Oriented Development (TOD) Planning Awards. Retrieved on 5/21/2016 from www.fta.dot.gov/grants/15926_16564.html.

Geller, J. (2015). New Balance Opens New World Headquarters at Boston Landing. *Boston Globe*, September 17, 2015. Retrieved on 5/21/2016 from www.bostonglobe.com/business/2015/09/17/new-balance-opens-new-world-headquarters-boston-landing/KEQQERJkqmECS9Y0phViHN/story.html.

George, H. (1879). Progress and Poverty.

Gihring, T. A. (2009). The Value Capture Approach to Stimulating Transit Oriented Development and Financing Transit Station Area Improvements. Victoria Transport Policy Institute. Retrieved on 5/21/2016 from www.vtpi.org/gihing_tod.pdf.

Greater Cleveland Regional Transit Authority. (2016). RTA's HealthLine—The World-Class Standard for BRT Service. Retrieved on 5/31/2016 from http://www.riderta.com/healthline/about.

Gurdgiev, C. (2012). Land Value Taxation and Other Measures for Raising Public Investment Revenue: A Comparative Study. Available at SSRN 2029515.

Hagman, D. G., and Misczynski, D. J. (1978). Windfalls for Wipeouts: Land Value Capture and Compensation. Chicago: American Society Planning Association.

Hale, C. (2008). PPPs for Transit Oriented Development–4 Options. Paper presented at the Third International Conference on Funding Transportation Infrastructure.

Hong Kong Government (2015). Hong Kong: The Facts. Retrieved on 5/21/2016 from www.gov.hk/en/about/abouthk/factsheets/docs/population.pdf.

Hovee, E. (2008). Portland's Streetcar-Development Connection Portland Oregon: Portland State University Center for Real Estate.

Illinois General Assembly. (2015). Bill Status of SB0277 99th General Assembly, An Act Concerning Finance. Retrieved on 5/29/2016 from http://ilga.gov/legislation/BillStatus.asp?DocNum=0277&GAID=13&DocTypeID=SB&LegID=84238&SessionID=88&SpecSess=&Session=&GA=99.

Ishmael, P. (2014). Kansas City Streetcar Expansion Proposal Derails at the Polls. Forbes.com. Retrieved on 6/1/2016 from http://www.forbes.com/sites/patrickishmael/2014/08/31/kansas-city-streetcar-expansion-proposal-derails-at-the-polls.

Jim, C., and Chen, W. Y. (2009). Value of Scenic Views: Hedonic Assessment of Private Housing in Hong Kong. Landscape and Urban Planning, 91(4), 226–234.

Kansas City. (2012a). City Council of the City of Kansas City, Missouri and Board of Commissioners of the Port Authority of Kansas City, Missouri v. Kansas City Area Transportation Authority, et al. Findings of Fact, Conclusions of Law and Judgement Relative to Conducting Formation Election. Circuit Court of Jackson County, Missouri at Kansas City. Retrieved from www.kcmayor.org/cms/wp-content/uploads/2012/04/1216-CV02419jmnt.pdf.

Kansas City. (2012b). Community Project/Zoning Ordinance Fact Sheet. Retrieved on 4/20/2016 from: http://cityclerk.kcmo.org/liveweb/Documents/ViewAttachment.aspx?q=tvAmuN%2Bd60mwjXVDp8rE5d95btfaORRIiZ8KrBlFSZKxWVeRsKp%2B3QdHXDIOnQmAeuk%2FqB5zFnWoG1O9ILTk%2FHUUkJFS3Hs9.

Kansas City. (2012c). Frequently Asked Questions Regarding the Proposal: Kansas City Downtown Streetcar Transportation Development District. Retrieved from www.kcsmartmoves.org/pdf/downtownAA/KCStreetcar-Open-House-TDD-FAQs.pdf.

Kansas City. (2016a). FAQ Local Funding to Expand Streetcar. Retrieved on 4/20/2016 from http://kcmo.gov/streetcar/faq-local-funding-to-expand-streetcar/.

Kansas City. (2016b). Adopted City Budget. Retrieved on 5/16/2016.

Knaap, G. J., Ding, C., and Hopkins, L. D. (2001). Do Plans Matter? The Effects of Light Rail Plans on Land Values in Station Areas. *Journal of Planning Education and Research*, 21(1), 32–39. doi:10.1177/0739456x0102100103.

Lam, W. H., and Bell, M. G. (2002). Advanced Modeling for Transit Operations and Service Planning.

Long, C. (2011). Finance for Real Estate Development. Washington, D.C.: Urban Land Institute.

Massachusetts Executive Office of Administration and Finance. (2016). Overview of I-Cubed. Retrieved on 5/21/2016 from http://www.mass.gov/anf/budget-taxes-and-procurement/cap-finance/i-cubed/overview-of-i-cubed.html.

MassDOT. (2012). MassDOT, New Balance Announce Brighton Station. MassDOT Blog. Retrieved on 5/21/2016 from blog.mass.gov/transportation/mbta/new-balance-massdot-announce-brighton-station/.

Mathur, S. (2014). *Innovation in Public Finance Transport: Property Value Capture.* London: Ashgate Publishing.

Mathur, S., and Smith, A. (2012). A Decision-Support Framework for Using Value Capture to Fund Public Transit: Lessons from Project-Specific Analyses. MTI Report 11-14. San Jose: Mineta Transportation Institute.

MBTA. (2016). Design and Construction Project Briefing: Boston Landing at Allston/Brighton Station. 5/9/2016.

McIntosh, J., Trubka, R., and Newman, P. (2014). Can Value Capture Work in a Car Dependent City? Willingness to Pay for Transit Access in Perth, Western Australia. *Transportation Research Part A: Policy and Practice*, 67, 320–339. doi:dx.doi.org/10.1016/j.tra.2014.07.008.

Metropolitan Planning Council. (2016). Value Capture Case Studies: Washington, D.C. Metro Expansion to Dulles Airport. Retrieved on 4/16/2016 from www.metroplanning.org/news/6384/Value-Capture-Case-Studies-Washington-DC-Metro-expansion-to-Dulles-Airport.

Minnesota Valley Transit Authority. (2016). Retrieved on 1/25/2016 from www.mvta.com/park-and-ride/pa-eagan/.

Moody's Investor Service. (2011). Rating Action: Moody's Assigns "A2" Rating to $1 Billion of NYC Hudson Yards Infrastructure Corporation Senior Revenue Bonds. Global Credit Research, September 29, 2011.

Moody's Investor Service. (2014) Rating Action: Moody's assigns "A1" to Kansas City's $124.5M Special Obligation Bonds, Series 2014 A-C; Outlook is Stable.

Moynihan, P., Flier, R., Conley, C., and McCallum, L. (2016). Outsourcing of Real Estate Management and Development in the Public Sector. Pioneer Institute. Retrieved on 5/8/2016 from bgc.pioneerinstitute.org/outsourcing-of-real-estate-management-and-development-in-the-public-sector/.

MTR Corporation. (2014). MTR Corporation Annual Report. Retrieved on 5/21/2016 from www.mtr.com.hk/archive/corporate/en/investor/images/E119.pdf.

Orrick, J., and Datch, D. (2008). Special District Financing for Infrastructure—Sharing the Credit with Local Government. *Journal of Taxation and Regulation of Financial Institutions*, July/August, 2008, Vol 21, No 6. Retrieved on 5/8/2016 from www.linowes-law.com/media/site_files/36_JRO.pdf.

Padukone, N. (2013). The Unique Genius of Hong Kong's Public Transportation System. Retrieved 5/21/2016 from www.theatlantic.com/china/archive/2013/09/the-unique-genius-of-hong-kongs-public-transportation-system/279528/.

Ramos, L. E., Brown, J. R., and Nixon, H. (2015). The Transit Performance of Modern-Era Streetcars: A Consideration of Five U.S. Cities. Paper presented at the 94th Annual Meeting of the Transportation Research Board of the National Academies, Washington, D.C.

Raskin, J. B. (2013). The Routes Not Taken: A Trip Through New York City's Unbuilt Subway System. New York City: Fordham University Press.

Rocheleau, M. (2014). Boston Real Estate Firm to Co-Develop $500M New Balance Complex in Brighton. Boston.com, April 30, 2014. Retrieved on 5/21/2016 from www.boston.com/business/news/2014/04/30/boston-real-estate-firm-develop-new-balance-complex-brighton/lPNnqRXtT8vybT5Ii8Sf4J/story.html.

Salon, D., and Shewmake, S. (2011). Opportunities for Value Capture to Fund Public Transport: A Comprehensive Review of the Literature with a Focus on East Asia. SSRN Electronic Journal, 02/2011; DOI: 10.2139/ssrn.1753302.

San Francisco Office of Community Investment and Infrastructure. (2016). Transbay Redevelopment Project Area: Project Description. Retrieved on 08/22/2016 from http://sfocii.org/transbay.

Schachter, H., Daniel, J. R., and Liu, R. R. (2014). Feasibility and Efficacy of Public Transportation Partnerships.

Scurr, C., and S. Page. (2015). The People's Transportation Plan: Then and Now, Innovative Financing Solutions, MPO Fiscal Priorities Committee, Honorable Daniella Levine-Cava, Chair, July 20, 2015. Retrieved on 5/7/2016 from miamidadempo.org/library/presentations/MPO-Fiscal-Priorities-Committee/fiscal-priorities-committee-peoples-transportation-plan-presentation-2015-07-20.pdf.

Semuels A. (2015). New Balance Bought Its Own Commuter Station. The Atlantic. Retrieved on 5/21/2016 from www.theatlantic.com/business/archive/2015/05/new-balance-bought-its-own-commuter-rail-station/392711/.

Smart Growth America (2015). Fast Act Contains New Ways to Finance Transit-Oriented Development. Retrieved 5/21/2016 from: www.smartgrowthamerica.org/2015/12/17/fast-act-contains-new-ways-to-finance-transit-oriented-development/.

Switaj, C. (2016). Bruins Break Ground on New Practice Facility in Boston. Retrieved on 5/21/2016 from http://bruins.nhl.com/club/blogpostprint.htm?id=34719BostonBruins.com/.

Tang, B., Chiang, Y., Baldwin, A., and Yeung, C. (2004). Study of the Integrated Rail-Property Development Model in Hong Kong. Research Centre for Construction & Real Estate Economics, Department of Building & Real Estate, Faculty of Construction & Land Use, the Hong Kong Polytechnic University.

Thompson, R. (2006). Portland's Streetcars: Arcadia Publishing.

Transbay Transit Center. (2016). Image Gallery. Retrieved on 8/20/2016 from http://transbaycenter.org/media-gallery/image-gallery/transit-center-architecture.

TriMet. (2016). Airport MAX: Red Line. Retrieved on 5/21/2016 from trimet.org/pdfs/history/railfactsheetairport.pdf.

United States Government Printing Office. (2015). Fixing America's Surface Transportation Act (FAST) of 2015. Pub.L. 114-94. Retrieved 5/21/2016 from www.gpo.gov/fdsys/pkg/BILLS-114hr22enr/html/BILLS-114hr22enr.htm.

University of San Diego. (2015). The New Blue: Metropolitan Transit System Trolley Line to Be Renamed UC San Diego Blue Line. July 16, 2015. Retrieved on 5/31/2016 from: http://www.sdmts.com/inside-mts/news-release/new-blue-metropolitan-transit-system-trolley-line-be-renamed-uc-san-diego.

Vadali, S. R., Aldrete, R. M., and Bujanda, A. (2009). Financial Model to Assess Value Capture Potential of a Roadway Project. *Transportation Research Record: Journal of the Transportation Research Board, No. 2115*, Transportation Research Board of the National Academies, Washington, D.C., pp.1–11.

Wong, M. (2015). Hong Kong's MTR: Taking a Ride on the World's Most Envied Metro System. Retrieved on 5/21/2016 from www.cnn.com/2015/03/29/travel/hong-kong-mtr-success-story/.

Zhang, M. (2007). *Chinese Edition of Transit-Oriented Development. Transportation Research Record: Journal of the Transportation Research Board No. 2038*, Transportation Research Board of the National Academies, Washington, D.C., pp. 120–127.

Zhao, Z. J., and Das, K. V. (2012). Joint Development as a Value Capture Strategy in Funding Public Transportation. *Journal of Transport and Land Use*, Volume 5, Issue 1, pp. 5–13. dx.doi.org/10.5198/jtlu.v5i1.142.

Zhao, Z. J., and Larson, K. (2011). Special Assessments As A Value Capture Strategy For Public Transit Finance. *Public Works Management & Policy*, April 1, 2015 20: 127–145.

Notes

[1] New buildings, particularly at higher densities and intensity of land use than those that may have preceded them, may require a broad array of supportive infrastructure. This includes new streets, drainage facilities, and wet and dry utilities, including potable water and wastewater treatment plant capacity. Trunk utility lines (such as sewer mains), lift stations, surface transportation improvements, and electrical distribution capacities may need to be developed or expanded at a significant distance from the development site itself. Each of these undertakings requires planning and coordination. Regulatory entitlement, including plan modifications, zoning, permits, approvals, and development agreements required to effect such development, may entail significant investment of time and expense. The researchers have referred to these efforts occurring generally before the development begins as "predevelopment."

[2] Senior debt is debt that must be repaid first. It has priority over other debt, such as subordinate or junior debt.

[3] For more information on the U.S. DOT's Build America Bureau, please see https://www.transportation.gov/buildamerica.

[4] For more information on encouraging TOD that is broadly inclusive of affordable housing, please see The Mixed-Income Transit-Oriented Development Action Guide funded by the FTA, http://mitod.org/tools.php.

[5] For more information on availability payments, please see http://www.financingtransportation.org/funding_financing/financing/other_finance_mechanisms/availability_payments.aspx.

[6] MTR Corporation Limited is commonly referred to as MTR Corporation or MTRC. This report will refer to the corporation as MTRC and to the rail system as MTR.

[7] In some cases, MTRC may purchase properties or lease rights from HKSAR, but these are not arm's-length transactions and are also at below-market prices.

[8] Assuming that HKSAR's cost basis in land transferred to MRTCL does not exceed its share of profits.

[9] HKSAR state formally owns all land. The government leases land to private parties for development.