



REPORT | FEBRUARY 2023

PUBLIC-PRIVATE PARTNERSHIPS

FOR THE MASSACHUSETTS BAY

TRANSPORTATION AUTHORITY



REPORT TEAM

Written By:

Professor Jonathan Gifford, George Mason University

Edited By:

Caitlin Allen-Connelly, Senior Advisor on Transportation



This report was made possible through the generous support of the Barr Foundation (Grant #19-07816)

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
PREFACE	ii
EXECUTIVE SUMMARY	iv
TABLE OF CONTENTS	ix
PUBLIC-PRIVATE PARTNERSHIPS FOR PUBLIC TRANSIT	1
P3 KEY FEATURES & CORE CONCEPTS	10
PEER AGENCY: LESSONS LEARNED	20
KEY FINDINGS, RECOMMENDATIONS, CONCLUSION	34
APPENDIX A: FUNDING & FINANCING OPTIONS	37
APPENDIX B: PROJECT EVALUATION TECHNIQUES	42
APPENDIX C: EXPLORING & ESTABLISHING A P3 PROGRAM	46
REFERENCES	56



A Better City represents a multi-sector group of nearly 130 business leaders united around a common goal: to enhance the Greater Boston region’s economic health, competitiveness, equitable growth, sustainability, and quality of life for all communities. By amplifying the voice of the business community through collaboration and consensus-building, A Better City develops solutions and influences policy in three critical areas: 1. transportation and infrastructure, 2. land use and development, and 3. energy and the environment. A Better City is committed to building an equitable and inclusive future for the region that benefits and uplifts residents, workers, and businesses in Greater Boston.

ACKNOWLEDGMENTS

In 2018, with support from the Barr Foundation and the Boston Foundation, A Better City released the groundbreaking report, *The Transportation Dividend: Transit Investments and the Massachusetts Economy*. The publication unveiled the deep connection between, and value of, the Commonwealth's public transit system and the regional economy, and it made the case for critical investments in reliability, capacity, and connectivity to build out a system fit for the 21st century.

The Barr Foundation provided a second grant in 2019 to build the Massachusetts Bay Transportation Authority's (MBTA's) capacity to implement the recommendations set out in the 2018 report, prioritizing four output areas, including 1) Worcester/Framingham Line I-90 Mitigation Pilot, 2) Pricing Models, 3) Regional Rail Procurement, and 4) Project Development and Delivery. In September 2019, A Better City met with the MBTA to identify priority topics that would add the most value and have the greatest impact. The top priorities were job order contracting and public-private-partnerships (P3s). This report focuses project financing, procurement, and delivery through P3s.

With the onset of the COVID-19 pandemic, work on this report was slowed due to shifting priorities within the MBTA to address and mitigate impacts of COVID-19 on the public transit system. A Better City is grateful to the MBTA; the Barr Foundation; the TDIP Advisory Committee, in particular Walter Armstrong, Senior Vice President, Capital Facilities and Engineering, Beth Israel Deaconess Medical Center; and the author of the report, Professor Jonathan Gifford of George Mason University, for their continued engagement, guidance, and ability to adapt in the face of COVID-19.

PREFACE

The Massachusetts Bay Transportation Authority (MBTA) is the 5th largest transit system in the United States. Prior to the COVID-19 pandemic, the T carried 1.3 million passengers per day over 175 communities in Massachusetts, accounting for 55% of work trips in the region. Metropolitan Boston, which is responsible for 84% of total Gross Domestic Product (GDP) in Massachusetts, is known as a “legacy transit” region where land use and development have been organized around the public transit system for over a century. The MBTA generates enormous, quantifiable benefits to the region’s residents and business in travel time and cost savings, accident avoidance, and reduced emissions from personal vehicles for a combined monetized value of approximately \$11.4 billion annually.¹

The MBTA’s annual budget is about \$2 billion. There is a growing backlog of projects, estimated at \$7.3 billion, needed to achieve a state of good repair (SGR), and a number of unfunded yet critical transformational projects in the pipeline.² The level of investment required to make continuous progress on SGR projects as well as implement new projects calls for innovative project delivery methods, including the full range of public-private-partnership (P3) contracts, to accelerate repairs and expand financing options in addition to using state and federal dollars to accommodate future growth in the region and keep the system from becoming overburdened.

The legislative foundation for P3s was established with the Massachusetts Transportation Reform Act of 2009 and the Massachusetts (MA) General Laws, Chapter 6C, Sections 1 to 74. Under these legislative measures, any statutory authority is specific to the State’s Department of Transportation (MassDOT). The legislation, as it is currently written, does not extend awarding authority to the MBTA to engage in the full range of P3 contracts, i.e. design-build-finance-operate-maintain (DBFOM). The MBTA does, however, utilize more traditional P3s to outsource operations and maintenance (O&M) services, i.e. Commuter Rail, station and vehicle cleaning, and RIDE paratransit service. The Authority has also entered into more complex P3s for capital improvements; real estate, including station development and redevelopment, transit oriented development, leases and commercial space; as well as innovative technology.

In July 2019 and February 2021, Governor Baker put forward language in the Transportation Bond Bill that would grant the MBTA “awarding authority” to “utilize alternative procurement methods to procure and enter into contracts for the engineering, designing, building, financing, operation and maintenance of infrastructure, technology and services, or any combination of the foregoing; provided that such procurement process includes a procedure to solicit and award a contract for any of the foregoing purposes on the basis of a best-value selection process.”³ In other words, the MBTA would have the authority to solicit proposals and enter into Design-Build-Finance-Operate-Maintain (DBFOM) and Design-Build-Operate-Maintain (DBOM) contracts. The language was not passed due to concerns from a range of stakeholders, including perceived challenges with the bidding process, wage standards, and risk allocation.

1. [A Better City \(2018\), Transportation Dividend](#)

2. [Ibid.](#)

3. <https://budget.digital.mass.gov/govbudget/fy22/outside-section>

There are pros and cons to entering into P3s for public transit, as this report will outline, but they have been successfully used in other parts of the world to deliver transformative transportation projects. With the growing pipeline of large projects to modernize and decarbonize the Commonwealth and region's transportation infrastructure, P3s are options or part of a range of options that the MBTA may pursue to design, build, finance, and potentially operate and maintain one or more of these projects. For this reason, the MBTA should have the ability to engage in the full range of P3s in its toolkit.

This report serves as a primer on P3s and aims to deepen the MBTA's capacity to engage in the full range of P3s in the future.

EXECUTIVE SUMMARY

Public-private partnerships (P3s) offer transit agencies an opportunity for more cost-effective delivery of their transit services. Successfully implemented P3s offer a combination of greater cost and schedule certainty, lower lifetime costs, faster design, construction, and startup of service, state-of-the-art technology, and reliable and consistent service quality for periods up to thirty years or longer.

P3s are long-term contracts between a transit agency and a consortium of companies assembled to address a specific transit agency project. Projects may range from the improvement of a specific transit line or service, the development or redevelopment of a station or group of stations, the development of transit property assets like switching yards, bus depots or air rights, and beyond. The term of contracts is usually several decades, depending on the specific assets and services involved.

In a typical arrangement, the transit agency signs a contract with a consortium to design, build, finance, operate, and maintain a transit project. The transit agency promises a series of payments over the life of the agreement, usually as “availability payments” to the consortium for making the service “available.” The contract specifies the delivery schedule and performance requirements. Failure to meet either stipulation results in reduced payments. At the end of the contract, assets are turned over to the transit agency in a good state of repair. The agency can then either take over operation and maintenance itself or launch a new procurement to continue operation and maintenance under contract.

While transit P3s are more widely used in Canada, the U.S. market is beginning to utilize public transit P3s albeit with mixed success. The biggest projects are the Eagle P3, a 23-mile commuter rail line from downtown Denver to the airport; the Purple Line, a new 16-mile light rail line in the Maryland suburbs of Washington, D.C.; and the Sepulveda Pass project, a \$10 billion transit corridor project in Los Angeles. Transit agencies are also using P3s to redevelop stations. For instance, Denver used its historic Union Station as the centerpiece of a large transit-oriented development (TOD) including 1.5 million square feet of mixed-use development on forty acres around the historic station. Parts of the station have been converted to a boutique hotel. The site includes ten acres of open plazas, an eight-track commuter rail facility, and a 22-bay regional bus facility.

Successful implementation of P3s requires that a transit agency prepare itself to take full advantage of the benefits of P3s, and to avoid their pitfalls, which can be significant. This requires the transit agency to have adequate statutory authority and financial resources, appropriately trained staff, and adequate resources for outside advisors on legal, technical and financial matters.

Because P3s are a different way of doing business, transit agencies using them must be prepared to move beyond business as usual. P3 contracts typically involve performance standards, in the form of key performance indicators (KPIs), that allow concessionaires to use new technologies, design approaches, materials, and operating protocols. If a transit agency is not willing to make

such changes or is unable to make such changes due to statutory or regulatory restrictions, then a P3 might offer limited value. P3s do not by any means relieve the transit agency of all risks. Some risks simply cannot be transferred to a P3 efficiently — the private sector would either be unwilling to take the risk or require an unaffordable payment to do so. For example, transit agencies typically retain risks related to environmental permitting. Projects do not typically commence until a federal record of decision (ROD) is in hand. In the Purple Line case cited above, a federal judge suspended an already-issued ROD in an unprecedented ruling. While a higher court eventually reinstated the ROD, the transit agency is absorbing the cost of the delay.

Most P3 projects take advantage of the federal Transportation Infrastructure Finance and Innovation Act (TIFIA) and Railroad Rehabilitation and Improvement Financing (RRIF) loan programs, which can loan a third of a project's cost (in some cases up to half) at the U.S. Treasury interest rate. The Massachusetts Bay Transportation Authority's (MBTA) has already used these loan programs for its Positive Train Control (PTC) project. Often, P3s combine a transit agency's federal grants with TIFIA and RRIF loans to fund and finance projects. The federal government also offers technical assistance to transit agencies contemplating the use of P3s.

For the MBTA, a P3 may be a valuable option for renewing and expanding some of its facilities and services to address its State of Good Repair (SGR) backlog, and implement transformational projects like Regional Rail and the Better Bus Project, among others.

A. RECOMMENDATIONS FOR THE MBTA

As the Massachusetts Bay Transportation Authority (MBTA) assesses whether and how P3s might contribute to its mission in light of their strengths and limitations, it should take into consideration the following recommendations.

- **Consider widening its use of P3s for the renewal or expansion of its existing and future transit services, or the redevelopment of the properties and other assets that it owns.** P3s are coming into increasing use in U.S. transportation projects because of their capacity to accelerate project delivery, improve risk management by transferring appropriate risks to the private sector, enable the use of innovative technology and approaches, and ensure long-term service quality and availability. P3s may be particularly useful for the implementation of new types of service, as was the case with Canada's Ontario Line.
- **Review its full inventory of property and operations to assess the feasibility of employing P3s.** Transit agencies typically own substantial amounts of property in the form of stations, storage yards, right of way alignments, buildings and parking facilities, including air rights, that may have potential as P3 projects. In some cases, transit P3s can generate new revenue through development, redevelopment and value capture approaches using these assets, or even the use of naming rights, as was the case with San Francisco's Salesforce Transit Center. Working with a master developer for station projects may help MBTA take full advantage of its assets, as was the case with Denver's Union Station project and Washington Metro's Grosvenor-Strathmore Station.

- **Extend and supplement its existing expertise to ensure that any P3 procurement is appropriate for the projects under consideration and to support the agency for a successful procurement.** Transit agencies embarking on new or expanded P3 programs typically build their institutional capacity with a combination of new personnel, training and education of current personnel, and contracting with outside technical, financial and legal advisors. Substantial training and education resources are available through the U.S. Department of Transportation’s Federal Transit Administration, Federal Highway Administration, and Build America Bureau to support agencies in their endeavors.
- **Use P3 procurement to provide strong incentives to competing proposers to develop innovative, cost effective approaches to meeting agency requirements using the best available technology, construction, operations and maintenance practices and financial resources.** A competitive P3 procurement can help agencies obtain the best value for money. The winning concessionaire team should have strong financial incentives to deliver the project on-time and on-budget and to operate and maintain the project in strict accordance with the transit agency’s performance requirements.
- **Recognize that to take full advantage of a P3, it may need to focus its attention on performance standards and relinquish reliance on design standards for a project.** P3s often add value for money by doing things differently than they have been done before. Such differences may entail new technologies, new procedures, new construction techniques and materials, and new operating practices.
- **Understand that realizing the benefits of a P3 will require early agreement on the project’s scope.** Because the P3 is embedded in a binding contract, a change of mind midstream by the MBTA could lead to substantial cost increases and delays. Thus, investing the time and effort upfront in the development of a project’s scope and objectives is of paramount importance.
- **Acknowledge that any public transit P3 will require a long-term financial commitment from the agency to support availability payments to the concessionaire.** P3s do not provide “free money” for public transit. Transit agencies must have the financial capacity to support the P3.
 - **Availability payments are typically treated as debt by rating agencies and government accounting standards.** As such, these payments may require coordination with and approval from state financial authorities.
 - **The Federal Government offers substantial credit support programs for public transit P3 projects in the form of loans from its Transportation Infrastructure Finance and Innovation Act (TIFIA) and Railroad Rehabilitation and Improvement Financing (RRIF) programs.** The MBTA has already utilized TIFIA and RRIF for its Positive Train Control project and should continue to take maximal advantage of these resources.
 - **Financial crises do not necessarily have to derail P3s.** Many projects were delivered during the global financial crisis of 2008/2009. The financial crisis severely disrupted global financial markets. Yet, many P3s, such as the Denver Eagle P3 commuter rail project, were able to continue to financial close in spite of these disruptions.

- **Ensure appropriate protection for the agency in the P3 agreement in case the project(s) encounter difficulties throughout the development life cycle for risks that have been transferred to the concessionaire.** Risks that are often transferred to the private sector concessionaire through a P3 include design risk, construction risk, financial risk and operation and maintenance risk.
 - **P3s do not transfer all risks to the private sector.** While P3s allow the transfer of many risks to the private sector, and the sharing of some risks with the private sector, the transit agency almost always retains significant risks. Key risks that are typically retained by the transit agency include obtaining environmental approvals such as the National Environmental Policy Act (NEPA) Records of Decision (RODs), as was the case in the Maryland Purple Line project, timely acquisition of right of way (ROW), and changes in law or regulation that affect the cost of project delivery, as was the case in the Denver EAGLE P3 project.
 - **Great care should be used in figuring out which risks can be borne cost effectively by the private sector, which are more suitable to be retained by the agency, and which can effectively be shared.** A successful procurement will generally require extensive discussions with the private sector on these risk allocation issues.
- **Engage actively in outreach and communications for any P3 project it pursues, both inside the transit agency and with its outside constituencies and stakeholders.** Such outreach and communications should include emphasis on how the process works as well as its strengths and its limitations. Because the P3 approach is relatively new in the U.S. market, elected officials, community and business leaders, the press and stakeholder groups, as well as internal stakeholders across the transit agency may not be familiar with the concept. An active outreach and communications process can heighten understanding and allay unwarranted concerns.

B. REPORT ORGANIZATION

This report outlines the basic features of public-private partnerships (P3s) for public transit and explains the roles and responsibilities of the public and private entities involved. It also outlines the pros and cons of entering into P3s for transit agencies, as well as how transit agencies can take full advantage of P3s and avoid their pitfalls.

The report is structured in four chapters and three appendices. Chapter I provides a brief introduction, defines the various types of transit P3s, and examines their advantages and limitations. Chapter II goes deeper into key features and core concepts for P3s. Chapter III contains five case studies, including the Purple Line and Denver Eagle projects, as well as Toronto’s “light metro” Ontario Line (using technology similar to London’s Docklands Light Railway), the redevelopment of Denver’s Union Station as a TOD, and San Francisco’s Salesforce Transit Center. Chapter IV concludes with findings and recommendations.

The appendices provide greater depth on specific topics. Appendix A addresses funding and financing options using P3s. Appendix B details techniques for evaluating P3s at the project and the programmatic level. Appendix C provides a step-by-step approach to exploring and

establishing a P3 program and identifies additional resources that are available from the U.S. Department of Transportation, which has developed tools, case studies, and training programs aimed at transportation agencies, both highway and transit, interested in exploring P3s further.

TABLE OF CONTENTS

ACKNOWLEDGMENTS

PREFACE

EXECUTIVE SUMMARY

- A. RECOMMENDATIONS FOR THE MBTA
- B. REPORT ORGANIZATION

TABLE OF CONTENTS

I. PUBLIC-PRIVATE PARTNERSHIPS FOR PUBLIC TRANSIT

- A. INTRODUCTION
- B. DEFINITION, TERMINOLOGY & TYPOLOGY
- C. ADVANTAGES OF P3S
 - 1. GREATER CLARITY ON PROJECT SCOPE
 - 2. ENHANCED RISK MANAGEMENT & TRANSPARENCY
 - 3. EXPANDED OPTIONS FOR PROJECT FINANCING
 - 4. GREATER CAPACITY FOR ADVANCED TECHNOLOGIES
 - 5. IMPROVED LIFE-CYCLE ASSET MANAGEMENT
- D. LIMITATIONS OF P3S
 - 1. LIMITATIONS ON RISK TRANSFER
 - 2. REQUIRE SHIFT TO PERFORMANCE STANDARDS FROM DESIGN STANDARDS
 - 3. P3S DO NOT “CREATE MONEY”
 - 4. AVAILABILITY PAYMENT OBLIGATIONS ARE REPORTED IN THE GOVERNMENT’S FINANCIAL STATEMENTS
 - 5. HIGHER TRANSACTION COSTS

II. P3 KEY FEATURES & CORE CONCEPTS

- A. PROJECT EVALUATION PROCESS
- B. SCOPING OPTIONS
- C. RISK ASSESSMENT & ALLOCATION OF RESPONSIBILITY
 - 1. CATEGORIES OF RISKS
 - 2. APPROACHES TO TRANSFERRING & SHARING RISKS
 - 3. LIMITATIONS TO RISK TRANSFER & SHARING
- D. P3 FUNDING & FINANCING
- E. INSTITUTIONAL ARRANGEMENTS

III. PEER AGENCY: LESSONS LEARNED

- A. RAIL
 - 1. PURPLE LINE (MARYLAND)
 - 2. EAGLE P3 PROJECT (DENVER)
 - 3. GO RAIL (METROLINX – TORONTO, ONTARIO, CANADA)

TABLE OF CONTENTS

III. PEER AGENCY: LESSONS LEARNED (CONT.)

B. STATION

1. DENVER UNION STATION
2. SALESFORCE TRANSIT CENTER (SAN FRANCISCO)

IV. KEY FINDINGS, RECOMMENDATIONS, CONCLUSION

APPENDIX A: FUNDING & FINANCING OPTIONS

- A. FEDERAL PROGRAMS FOR P3 FUNDING & FINANCING
 1. FEDERAL GRANT PROGRAMS
 2. FEDERAL LOAN & CREDIT SUPPORT PROGRAMS
- B. PRIVATE FINANCING
 1. TYPES OF INVESTMENTS
 2. CATEGORIES OF INVESTORS
- C. VALUE CAPTURE & JOINT DEVELOPMENT

APPENDIX B: PROJECT EVALUATION TECHNIQUES

- A. VALUE FOR MONEY ANALYSIS
 1. QUALITATIVE VALUE FOR MONEY
 2. QUANTITATIVE VALUE FOR MONEY
- B. FINANCIAL VIABILITY ASSESSMENT
- C. ECONOMIC ASSESSMENT: BENEFIT-COST ANALYSIS

APPENDIX C: EXPLORING AND ESTABLISHING A P3 PROGRAM

- A. THE PRE-PROCUREMENT PHASE
 1. STRUCTURING THE PROCUREMENT TEAM
 2. PROJECT DELIVERY STRATEGY
- B. STARTING THE PROCUREMENT
- C. THE PRE-SELECTION PERIOD
- D. SELECTION TO COMMERCIAL & FINANCIAL CLOSE
- E. FROM FINANCIAL CLOSE FORWARD
- F. INSTITUTIONAL ARRANGEMENTS
 1. P3 OFFICE
 2. OUTSIDE ADVISERS
 3. CAPACITY BUILDING
 4. COMMUNICATIONS & PUBLIC OUTREACH
- G. UNSOLICITED PROPOSALS

REFERENCES

PUBLIC-PRIVATE PARTNERSHIPS FOR PUBLIC TRANSIT

A. INTRODUCTION

The public-private partnership (P3) is a relatively new approach to delivering public transit in the U.S. Transit P3s began to appear in the early 2000s, following the appearance of highway P3s in the 1990s. P3s offer transit agencies a potentially better way to manage the risks inherent in delivering transit projects and services. P3s can also provide new sources of financing for projects and better access to new technologies. They can also help transit agencies achieve better long-term asset management and service delivery.

This report explains public transit P3s and how they might be useful for the Massachusetts Bay Transportation Authority (MBTA). The report provides a high-level description of the key features of P3s. It also sets forth a process for exploring and establishing a P3 program. The report includes high-level descriptions of analytical tools and concepts used for assessing whether P3s are appropriate for delivering particular projects or programs of projects. The report also includes a discussion of the limitations and potential pitfalls of using P3s.

The report is organized as follows. The report is divided into four chapters and three appendices. The remainder of this chapter I provides an overview of the P3 concept. Chapter II provides more detail on the P3's key features. Chapter III contains case studies of five projects that have used P3s in different ways.

1. Maryland is using a P3 to deliver a new suburb-to-suburb commuter line, the Purple Line, which includes several transit-oriented developments (TODs) around stations. The project has encountered challenges that have affected the P3 and shed light on the limitations of the P3's ability to shift risk to the private sector (see section III.A.1).
2. Denver has used a P3 to deliver new commuter rail lines, including one from downtown to the airport (see section III.A.2).
3. Canada has used transit P3s much more extensively than the U.S. Ontario's transit agency for the greater Toronto area, Metrolinx, is using a P3 to deliver a new rapid rail line (see section III.A.3).
4. Denver has also used a P3 to redevelop its downtown railroad station as the centerpiece of a new TOD (see section III.B.1).
5. The Salesforce Transit Center in San Francisco illustrates how a transit agency can use naming rights to attract private sector capital (see section III.B.2).

Following the case studies, Chapter IV contains key findings and recommendations. Appendix A contains more detailed information about the funding and financing elements of P3s, including federal grant and loan programs, private financing and value capture. Appendix B provides more in-depth coverage of three widely used project evaluation tools: value for money (VfM)

analysis, financial assessment, and economic assessment using benefit-cost analysis. Appendix C contains a step-by-step process for transit agencies wishing to explore establishing a P3 program in more depth

B. DEFINITION, TERMINOLOGY & TYPOLOGY

A public-private partnership (P3) is a procurement tool that can allow transit agencies to improve the delivery of facilities and services through more predictable costs and schedules and better service quality. A 2019 federal guide defines a P3 as a “procurement of a long-term contract for multiple elements that may include development (design and construction), [or] operations and maintenance of a facility that involves a component of private financing.”⁴ Each of the underlined terms is important:

- Development typically includes both the design and construction of a facility such as a heavy or light rail line, a station or set of stations, vehicles, trainsets or other types of equipment, garages and other storage facilities, and maintenance yards and shops. The bundling of design and construction into a single contract contrasts with many procurement processes, where design and construction are contracted as separate activities.
- Operations & maintenance (O&M) refers to the ongoing operation of a facility or service as well as the routine and periodic maintenance of that facility. O&M may involve taking over an existing facility or service or the ongoing O&M of a new facility or service developed as part of the same contract. It may include the direct hire of labor for operations and maintenance, or the owner (transit property) may manage labor relations outside the P3.
- Financing refers to the raising and repayment of funds needed for design, construction, operations and maintenance. Funds may be drawn from the capital markets in the form of bonds or bank loans, through loans from federal or other governmental entities, and through at-risk investments of equity from private investors. Financing should not be confused with funding, which refers to how a service or facility is paid for, which for transit projects is usually some combination of farebox revenues and government subsidies, and in some cases value capture or joint development revenues.

There are a number of additional terms used in discussing P3s.

- The procurement contract itself is called a concession agreement, which is a contract between the public owner and the concessionaire. The concession agreement may also be called the project agreement or contract.
- The owner refers to the public party or agency that is entering into the concession agreement, which is typically a public transit agency. The word “owner” reflects the fact that the transit agency owns all of the public transit assets in the P3. The concession agreement simply grants the concessionaire the right and obligation to design, build, operate, and maintain those assets, depending on the details of the agreement.

4. Smith et al., “Public-Private Partnership (P3) Procurement,” 2, emphasis added (a joint product of the U.S. Federal Transit Administration and Federal Highway Administration).

- The concessionaire is a private company set up for the sole purpose of carrying out the work embodied in the concession agreement. It is sometimes called the project company or a special purpose vehicle (SPV). Depending on the needs of the particular P3 project, the concessionaire may contain a number of sub-entities, including a design builder contractor, an operations and maintenance contractor, a rolling stock provider, as well as other contractors needed for the particular P3.

P3s can take a variety of forms depending on the scope of the particular project:

- Design-Build (DB) P3s involve the design and construction of a facility or system. Once completed and accepted by the owner, the P3 dissolves, the lenders are repaid, and the equity owners recover whatever funds remain. DB projects typically involve some form of warranty for the product produced that may extend for several months, a year or longer. But for all intents and purposes, once development is complete the P3 dissolves.
- Design-Build-Operate-Maintain (DBOM) P3s bundle together development with operations and maintenance. The duration of a DBOM P3 may range from many years up to several decades. For example, the Eagle P3 commuter rail system in Denver (see section III.A.2) has a duration of 34 years (five years for design and construction and 29 years for operations and maintenance).⁵
- Design-Build-Finance-Operate-Maintain (DBFOM) P3s add financing to the DBOM P3 model. As discussed above, the financing assembles the funds required to design, construct, operate, and maintain the project from grants, loans and equity investments. Lenders and equity owners are paid from project revenues, including farebox, government payments, or revenues from joint development portions of a project.

C. ADVANTAGES OF P3S

P3s offer several potential advantages for public transit, including risk management and transparency, financing, advanced technical concepts (ATCs), and improved life-cycle asset management.

I. GREATER CLARITY ON PROJECT SCOPE

The scope of the P3 project defines the roles and responsibilities of the private and the public partners. These roles and responsibilities are embodied in a concession agreement. One of the strengths of the P3 approach is that it defines the scope of the project before the concession agreement is signed and typically entails extensive discussions and negotiations between the transit agency and potential bidders on the project to understand the scoping options and the advantages and disadvantages involved in them.

Advantages of P3s

1. Greater clarity on project scope
2. Enhanced risk management & transparency
3. Expanded options for project financing
4. Greater capacity for advanced technologies
5. Improved life-cycle asset management.

5. Han, "Denver Eagle P3 Begins Operations."

Getting the scope right upfront is critical to a successful project. Changes to the scope will generally require a renegotiation of the contract or change order. Such changes will usually come at a cost to the agency in some form—a greater payment, a longer concession term, or some other form of compensation or relief.

2. ENHANCED RISK MANAGEMENT & TRANSPARENCY

One of the principle differences between a P3 and a traditional procurement relates to risk allocation—design risk, construction risk, operations and maintenance risk, and financing risk. The delivery of transit services entails many risks. Most of these risks remain with the transit agency in traditional approaches to delivering transit. Moreover, the risks may not be very transparent to decision makers or the public at the time decisions are made. P3s offer a mechanism for making those risks more visible and transparent and hence, more readily managed.

Traditional procurement leaves substantially more risk on the public side, whereas P3s shift much more—but not all—risk to the concessionaire. In order for the concessionaire to accept these risks, its participants—equity investors, lenders, design-builders, operations and maintenance companies and equipment suppliers—must be satisfied that the risks are well identified and manageable.

When a public owner undertakes a project through traditional procurement, such risks are often not highlighted and assessed to nearly as great a degree. Traditional procurements typically rely on some form of a design-bid-build (DBB) approach, which places a significant amount of the project risk on the transit agency. With a DBB, the owner commissions a company to design a facility. Upon the completion of the design, the owner reviews and accepts the design as meeting its requirements and pays the designer. The owner then takes that design and puts it out to bid for construction. Construction firms bid and the owner selects one to build the project. Once construction is complete, the owner pays the builder. The owner then operates and maintains that facility over its service life, or sometimes contracts out the O&M.

There are several risks inherent in the DBB model, most of which are borne by the transit agency. There may be errors or omissions in the design that the agency does not detect at the time of acceptance. If the agency awards a construction contract based on that design and those errors or omissions become apparent during construction, then the agency has to compensate the builder for the design change (a change order). The agency can ask the designer to correct the design error, and possibly seek damages for the cost of the change order. But the onus of collecting is on the agency.

A design-build P3 transfers some of these risks to the concessionaire and away from the transit agency. Design and construction are bundled into a single contract between the agency and the concessionaire. If the agency or the concessionaire discovers a design error or omission during construction, the concessionaire has to absorb the cost. It is not passed back to the agency.

Another key and differentiating feature of P3s is that they typically use non-recourse financing. That is, the financing is provided from the balance sheet of the concessionaire rather than from the balance sheet of the government (as in public finance) or the private investors who own the

P3 concessionaire company (as in corporate finance). If a project runs over budget or fails to perform as stipulated in the project agreement due to risks the concessionaire has accepted, the financial hardship falls upon the concessionaire's equity investors and the lenders (both public and private lenders). The concessionaire does not have recourse to the government's budget. In that way, P3s can protect the government from a legal obligation to bail out troubled or failed projects, although political pressure for bailouts may still exist.

The P3 does not, however, protect the transit agency from all risks. The concession agreement will clearly allocate which risks are transferred to the concessionaire, which are retained by the transit agency, and which are shared. If a risk retained by the transit agency is realized, the transit agency will be responsible for covering the cost. In the case of the Purple Line light rail line in Maryland, for example, ultimately the state agreed to contribute an additional \$250 million to the project in order to resolve claims by the concessionaire of increased costs due to delays after financial close caused by a legal challenge to the project (see case study in section III.A.1).

3. EXPANDED OPTIONS FOR PROJECT FINANCING

The availability of funds to pay for transit projects is almost always a significant issue. P3s do not create money—ultimately funds have to come from the farebox, dedicated taxes such as regional sales taxes, or operating subsidies from local, state or federal sources—but they have the potential to offer new financing opportunities for transit.

If the transit agency can assure adequate long-term funding, P3 financing can provide access to capital markets to attract equity investment and loans to cover the up-front costs of project design and construction and to ensure that funds are available for operations and maintenance, including periodic major maintenance. Investors in P3 projects include private infrastructure investment funds as well as pension funds, both from the U.S. and globally. Lenders include banks, municipal bond investors, and government lending programs.

Equity investors are only likely to participate if they can expect to earn a return on their investment that beats other opportunities in the market at comparable levels of risk. And lenders will only lend if they have a high level of certainty about being paid back in full, on time, with a competitive rate of interest.

When the P3 includes finance, as in a Design-Build-Finance-Operate-Maintain (DBFOM), the P3 concessionaire typically raises all the funds required to complete the project before “financial close,” which is when the project is finalized. Thus, the concessionaire has “money in the bank” through available lines of credit that allow it to commit funds on day one.

Traditional procurement, on the other hand, often faces significant uncertainty about available funding, which can delay project decision making and increase costs. Sometimes, traditionally procured projects may be broken up into smaller contracts in order to proceed in steps without full funding, which can also increase project costs.

This report delves further into issues of funding and financing in section II.D for a discussion of funding and financing concepts, and Appendix A for a discussion of government grant and loan programs, private financing and value capture.

4. GREATER CAPACITY FOR ADVANCED TECHNOLOGIES

Another potential advantage of P3s is that they can incorporate advanced designs, techniques and technologies to enhance transit service delivery that could be difficult to acquire through traditional transit procurement processes. Such alternate technical concepts (ATCs) may relate to design and construction or operations and maintenance. Moreover, the competitive pressure of the P3 procurement provides a strong incentive to proposal teams to come up with innovative solutions to problems that the transit agency simply may not have seen.

In the case of Maryland's Purple Line P3, for example, bidders proposed an alternative station design and configuration that saved considerable amounts for both construction and future operation. The ATC design could be built at ground level. Maryland's preliminary design, in contrast, required the station to be located on an elevated structure that would have required long track grades on structure and wind protection for the platforms.⁶

Transit agencies often utilize extensive design manuals and specifications to govern their project development. Sometimes these are required by regulation from state or federal agencies. A P3 may have more flexibility to utilize innovative designs and approaches to developing projects. Such flexibility might be granted, for example, in the legislation authorizing the use of P3s. Alternatively, regulatory or standard setting agencies may allow exceptions. Or the agency might grant such flexibility to bidders because the bidders will bear the risk of any future costs that might arise from the use of such techniques.

A key issue that influences the potential for ATCs is whether the P3 agreement specifies design standards or performance standards. Generally speaking, design standards specify how a particular device or structure is constructed. Performance standards, on the other hand, specify how the device or structure must perform and allow flexibility in how the design, construction and operations meet those performance standards. If the transit agency has the legal authority to grant a concessionaire flexibility to utilize ATCs, and chooses to use that authority, it may bring substantial cost savings or other benefits.

ATCs are also possible under traditional procurement. The competitive pressure of a P3 procurement, however, provides the bidders a strong incentive to identify the potential savings from ATCs. The P3 bidders may also bring greater familiarity with particular knowledge domains. For example, seasoned developers involved in the redevelopment of a station on the Washington Metro system recognized the potential for more than 2000 residential units, whereas the Metro had estimated that the site could accommodate only 400 units.⁷

5. IMPROVED LIFE-CYCLE ASSET MANAGEMENT

P3s also differ from traditional procurement in terms of operations and maintenance (O&M). The cost of O&M depends to some extent on the design of a facility. Sometimes it makes sense to spend more upfront in order to reduce O&M costs down the road. Life-cycle asset management is an approach to service delivery that seeks to minimize life-cycle costs.

6. Schneider et al., "P3s in the Mid-Atlantic Region and Beyond."

7. World Bank, "Railway Station Redevelopment Guidebook."

DBOM or DBFOM P3s enable better utilization of life-cycle asset management than traditional procurement. In principle, it is possible for a transit agency to practice life-cycle asset management through traditional procurement. However, in practice it is often very difficult to do so because agencies often utilize different sources of funds for capital and operations.

For example, the agency's capital funds may be allocated through a capital budget, government grants, or other capital programs. The cycle of the capital programs is often multi-year, since project development often takes substantially longer than a single budget year or biennium. The agency's capital projects division or office would be in charge of the design and construction. Unlike the capital costs, transit agencies typically fund O&M through annual or biennial government budgets. Those O&M funds compete in each budget cycle against other cost centers in the organization. In a tight budget year, the O&M budget might be squeezed, requiring the agency to defer planned maintenance to a subsequent budget period.

"Optimizing" life-cycle costing decisions in such an environment can be very challenging. At the design phase the capital projects group has to make assumptions about the availability of O&M funds over the service life of the project, which is often decades, a highly uncertain endeavor. If those future budget assumptions do not bear out, the life-cycle cost of the facility may be much higher due to deferred maintenance.

In a DBOM or DBFOM P3, on the other hand, capital and O&M funds are fungible. That is, the P3 has the flexibility to adopt a life-cycle asset management approach. It may spend more upfront to reduce life-cycle O&M costs. Or it may be able to save money upfront because it can be confident that funds for major maintenance in the future will be there when and in the amount needed. Thus, an agency may be able to take advantage of the benefits of life-cycle asset management more easily through a P3 than through traditional budgeting and procurement.

D. LIMITATIONS OF P3S

While P3s can provide advantages, there are also limitations associated with P3s, including limitations on risk transfer, required shift to performance standards from design standards, no revenue generation, reporting issues, and higher costs. These constraints should be assessed by transit agencies on a case by case (i.e., project by project) basis to determine if the benefits outweigh the limitations. This is generally done when deciding the project delivery strategy (see Appendix C).

Limitations of P3s

1. Limitations on risk transfer
2. Require a shift to performance standards from design standards
3. P3s do not "create money"
4. Availability payments are a form of debt
5. Higher transaction costs

I. LIMITATIONS ON RISK TRANSFER

P3s do not transfer all of a project's risks to the private sector. The transit agency typically retains many risks and shares some risks with the concessionaire. The transit agency must carefully and systematically manage and monitor the risks that it retains or shares.

For example, transit agencies typically retain the risk of obtaining environmental approvals. If a project encounters an unexpected delay in receiving or maintaining its environmental approvals, the cost of that delay would typically fall back on the public transit agency. For another example, transit agencies typically retain the risk of any changes in law or regulation that occur after financial close. The transit agency should carefully monitor legislative and regulatory proceedings that might affect its projects and ensure that any concerns are brought to the attention of legislators and regulators.

2. REQUIRE SHIFT TO PERFORMANCE STANDARDS FROM DESIGN STANDARDS

Taking full advantage of the benefits of P3s may require transit agencies to refocus their project oversight for certain aspects of project design, construction, operation and maintenance in order to realize the greatest benefit from creative approaches from concessionaires. For example, a concessionaire could propose an ATC that deviates from an agency's design and construction standards in order to save money or improve constructibility, while continuing to meet the agencies performance requirements. Or it might propose to use new materials or construction techniques that fall outside the normal procedures for the transit agency. As long as the risk of using the ATC falls on the concessionaire, the agency may stand to benefit. But the transit agency may face challenges in obtaining permission for such deviations. Internally, different departments overseeing, say, design and construction, or external regulators or standards-setting bodies, may not wish to devote resources to evaluating proposals that run afoul of standard business practice or that require development of performance-based standards to replace historically accepted design standards. The reasons may range from bureaucratic inertia to competing priorities for limited resources.

3. P3S DO NOT "CREATE MONEY"

P3s do not create money. For transit projects, funding to support the financing (that is, to repay lenders and compensate equity investors) is typically provided through availability payments. Under an availability payment arrangement, the government pays the concessionaire a negotiated fee when the concessionaire makes the facility or service "available." Such payments are typically some combination of construction milestone payments, paid as project construction is completed, and ongoing periodic payments in exchange for the continued availability of the facility or service.

Availability payments are subject to the terms of the project agreement. The concessionaire has a strong incentive to meet the contractual performance requirements because failure to do so would trigger financial penalties in the form of a reduced payment for a particular performance period or a payment withheld until the performance is restored.

Availability payment projects are different from so-called revenue risk projects. For revenue risk projects, project revenue is typically sufficient or nearly sufficient to support the project's financing. In revenue risk projects, the concessionaire takes the risk on future revenue generated by the project. Toll roads are an example of P3 projects that are sometimes delivered through revenue risk P3s. Some airport and parking facilities have sufficient revenue capacity to work as revenue risk projects as well.

Most transit projects cannot support the full cost of a project from the farebox, so they are not viable as revenue risk projects. In theory, however, revenues from a joint development that is part of a project's scope (such as a rail station or mixed-use development) could support a revenue risk project.

This does not mean that transit projects are not viable as P3s. It does mean, however, that the transit agency must ensure that the project is financially viable through a combination of dedicated availability payments, farebox revenues, joint development, transfer of air rights, or other sources of project funding.

4. AVAILABILITY PAYMENT OBLIGATIONS ARE REPORTED IN THE GOVERNMENT'S FINANCIAL STATEMENTS

In terms of government accounting, availability payment obligations are very similar to debt and their treatment in an agency's financial reports must generally reflect that. Rating agencies have long considered availability payment obligations to be a form of debt when they rate an entity. In March 2020, the Government Accounting Standards Board adopted statement 95, which requires states to report such obligations as debt.⁸

Many state and local governments are strictly limited in the amount of debt that they may incur. Such "debt caps" may limit a transit agency's capacity to enter into a P3. Or it may require the agency to obtain approvals from local or state government treasurers or other officials.

5. HIGHER TRANSACTION COSTS

P3s typically have higher transaction costs than traditional procurements. The transit agency usually retains special legal, financial, and technical advisers to develop the procurement documents and support the procurement. Traditional procurement, on the other hand, is more frequently handled with in-house resources. The need for supplementary outside advice may be higher on an agency's first P3 transaction, while it develops its own internal capacity, and entail significantly higher costs.

8. Hecht, "Are Availability Payment Obligations Debt?"; Government Accounting Standards Board, "Public-Private and Public-Public Partnerships and Availability Payment Arrangements."

P3 KEY FEATURES & CORE CONCEPTS

This chapter reviews several of the key features and concepts utilized in public-private partnerships (P3s). It begins with a discussion of evaluating projects for their suitability for delivery as P3s, then discusses options for the scoping of P3 projects, and afterward turns to assessing and allocating risks. Next, the chapter examines funding and financing options, including federal programs targeted specifically towards P3s, and closes with a discussion of the institutional arrangements transit agencies use for supporting a P3 project or program.

A. PROJECT EVALUATION PROCESS

A critical part of a transit agency's consideration of using P3s is the evaluation of whether a P3 is an attractive approach for delivering transit facilities and services. As discussed in more detail in Appendix B, such considerations entail a continuous process of evaluation and reevaluation as an agency's P3 program develops. This could start with a particular project that seems ripe for evaluation as a potential P3. Or it could start with an agency-wide review of assets and services that have potential for delivery as P3s.

There are three principal approaches to P3 project assessment that agencies should use to evaluate an opportunity.

1. The first and most widely used is Value for Money (VfM), which assesses whether development using a P3 will be cheaper for the agency than using its traditional delivery approach. That is, would the P3 generate value for money? VfM analysis compares two scenarios. The first is the public sector comparator (PSC), which is an estimate of how much it would cost the transit agency to deliver the project using traditional procurement. The second is the shadow bid, which is an estimate of what it would cost to deliver the project through a P3. If the PSC exceeds the shadow bid, then the project is said to have value for money.
2. The second evaluation approach is a financial viability assessment, which looks at project cashflows under various delivery scenarios to see if the agency's cashflows are able to support the cashflow requirements of the project.
3. The third approach is benefit cost analysis (BCA), which applies a societal perspective. The BCA essentially asks the question, "Will society be better off with option A or option B?" Appendix B describes each of these approaches at a fairly high level, with references to other resources for further inquiry.

All these forms of evaluation are fairly technical and typically would be developed by project analysts, either internal staff or outside consultants and advisors. All of these evaluations require assumptions about the future that may be quite speculative, since the impact of projects is often measured in many decades. The future of interest rates, economic activity, the state of technology, the costs of the inputs required for a project over its lifetime—all of these are highly uncertain.

As with any matter of public debate about projects, such uncertainty can give rise to “competing” models and assessments from different project stakeholders, both advocates and opponents. As a result, transit agencies need to be prepared to engage in a potentially robust public discourse about the merits of a particular project as well as the merits of the agency’s preferred project delivery strategy. This goes for P3s as much as any project delivery strategy, and perhaps slightly more because many stakeholders and decision makers may be unfamiliar with P3s. The agency’s internal staff and external advisors can assist the agency in managing such discussions effectively.

B. SCOPING OPTIONS

Defining the scope of a P3 project is an essential task. For a P3, the scope defines the roles and responsibilities of the transit agency and the concessionaire. As described in greater detail in Appendix C, the scope of a project may be refined significantly as a project advances through the procurement process.

One dimension of scope is how much of the project life-cycle the project will entail.

- Does the project entail a significant design and construction element?
- Will the project include operations and maintenance?
- Private sector financing is typically a part of P3s, but will the agency pay milestone payments upfront as any initial capital outlay is completed successfully? Or must the project recover upfront capital costs over the life of the project?
- What is the term of the agreement?
- Many P3s involve long-term contracts to construct facilities and then operate and maintain them over the life of the capital asset, for thirty or more years. Are there statutory or regulatory limits on the duration of transit agency agreements?

These questions are critical to resolve early in the pre-procurement phase in order to assess how to design a procurement.

Another dimension of scope is what aspects of the transit agency’s overall operation are involved. Transit agencies often operate a range of services, including metro rail, commuter rail, bus, and paratransit. Many transit agencies are exploring options for “first mile/last mile” agreements with transportation network companies like Uber and Lyft, or e-scooter companies like Bird or Lyft. Interest in such services has spiked with the COVID-19 pandemic and the need for maintaining safe “social distance” while traveling.

Exploring scoping options and selecting a scope is one of the first steps in the development of a P3 during the pre-procurement phase. One of the considerations for scoping is how much coordination is required between the P3 and the rest of the organization. A transit line or

function that is fairly self-contained might make a good candidate for a P3. One that shares facilities, equipment and/or labor with other of the agency's services might be a less attractive candidate. The transit agency's inventory of assets can help identify potential opportunities.

The scope of a P3 program or a particular P3 project could take a variety of forms, including asset bundling; greenfield projects; brownfield projects; tracks, signals, rolling stock and equipment; and transit stations. These are outlined below, followed by a more detailed discussion of transit stations.

- Asset bundling, whereby an agency with a number of smaller assets, such as bridges or stations, might bundle them together into a single P3 contract. The Pennsylvania Department of Transportation, for example, bundled 554 of its smaller bridges statewide into a single 30-year contract for renewal, operations and maintenance.⁹
- Greenfield projects are those that involve constructing, then operating and maintaining a new facility. An example of a greenfield project is the Denver Eagle line from downtown Denver to the Denver International Airport. Another example is Maryland's Purple Line P3 to deliver a new 16-mile light rail line. Case studies of both appear later in this report (see sections III.A.2 and III.A.1, respectively).
- Brownfield projects¹⁰ are those involving an existing facility or service, which may be structured into a P3 and incorporate existing facilities and equipment, sometimes including labor and sometimes not. A bus or rail operation, for example, might be structured into a P3 to renew facilities and equipment and operate and maintain service over a long term.
- Track, signals, rolling stock and equipment in a rail operation could support a vertically integrated P3. In theory, it is possible to split the operation into separate entities, say rolling stock and infrastructure. However, care needs to be taken that the P3 does not separate highly integrated activities.
- Transit stations also represent a potentially valuable asset class, including the station structure itself, the area around the station including supporting properties like parking, and private properties adjacent in the station's immediate vicinity. Another dimension of the scoping decision has to do with stations on a metro, commuter rail or light rail line.
- Public buildings owned by transit agencies may provide opportunities for P3s. The Performance-Based Building Coalition has supported extensive research and outreach on the use of P3s in building and renewing a wide variety of public buildings.¹¹

Transit stations are often extremely complex entities. By their nature, they involve intermodal or interservice transfers, sometimes involving multiple transit operators. Stations also typically involve facilities for taxis, transportation network operators (TNOs, like Uber and Lyft), parking, bicycle storage, and other services.

9. U.S. Department of Transportation, Build America Bureau, "Pennsylvania Rapid Bridge Replacement Project, Statewide."

10. The term "brownfield" does not connote anything about environmental conditions, as it does in the hazardous waste context.

11. The Performance-Based Building Coalition, "Public-Private Partnerships."

As places that create concentrations of people, stations also present commercial opportunities for restaurants, cafes and other food service options, as well as a wide range of services from shoe and luggage repair to convenience stores to luxury retail. Advertisers are another possible station user. Security and police also require space, access and service.

While many transit agencies have extensive experience with the operational side of stations, they often have only limited expertise in managing the commercial side. Recently, some station owners have entered into P3s for the delivery of some or all of a station. In some cases, the P3 has included not only the station proper, but also the area around the station, and in other cases, even adjacent properties. San Francisco’s Bay Area Rapid Transit (BART) system and the Metro system in Washington, D.C., are in the process of redeveloping some of their stations.¹²

BOX II-I: P3 for Station Redevelopment

SAN FRANCISCO BART STATION REDEVELOPMENT	WASHINGTON (D.C.) METRO STATION REDEVELOPMENT
<ul style="list-style-type: none"> • BART has created an office for real estate development around its stations. • Pleasant Hill Station in suburban Contra Costa County is being redeveloped with \$60 million in infrastructure improvements by BART and \$230 million private investment to produce 290,000 sf of office space, 36,000 sf of retail, 622 dwelling units (124 affordable), and 3000 parking spaces. • MacArthur Station in the urban City of Oakland is being redeveloped with \$48 million in infrastructure improvements by BART and \$462 million in private investment to produce new retail, 882 residential units (143 affordable), and 602 parking spaces. 	<ul style="list-style-type: none"> • Metro is redeveloping its Grosvenor-Strathmore Station in suburban Montgomery County, Maryland. The station is adjacent to a 2000-seat concert hall developed in 2005. Six acres of the 15-acre station site are being redeveloped as Strathmore Square, which will contain 318,000 sf of retail, more than 2000 residential units, and a 1.5-acre park. • Initial Metro estimates of the redevelopment capacity of the station was 534 residential units. The developer’s proposal recognized the potential for more than 2000 units.

SOURCE: World Bank, “Railway Station Redevelopment Guidebook” (pending publication)

Existing stations sometimes offer substantial scope for redevelopment in ways that can attract private investors to underwrite some of the capital improvements. In some cases, the station P3 might even generate net revenue for the station owner. The central rail station in Milan, Italy, for example, has been redeveloped to include substantially expanded areas for first-class retailers, transforming it from a place used primarily for passing through to reach trains to a destination in itself. The passenger railroads in Japan have also made extensive investments in their larger stations using P3-like arrangements.¹³ Smaller railway stations also provide an opportunity for bundling in a P3. The Italian National Railways, for example, has bundled renewal and expansion of some of its smaller stations into a single contract, which allows the P3 concessionaire to achieve some economies of scale.

12. World Bank, “Railway Station Redevelopment Guidebook.”

13. World Bank; Sakaki, “Railway Station Redevelopment: Overview”; Sakaki, “Railway Station Redevelopment: Case Studies in Japan.”

The air rights above stations, tracks and other properties are also sometimes valuable and can be incorporated into P3s using value capture. The redevelopment of Tokyo's central station made extensive use of air rights above the historic station as a source of investment to support the redevelopment of the station itself.¹⁴

C. RISK ASSESSMENT & ALLOCATION OF RESPONSIBILITY

As discussed earlier, one of the main advantages of using P3s is the ability to identify and manage risks. A fundamental principal of P3s is to assign risks to the parties most able to manage them effectively. This section starts with the categories of risks typically managed in a P3, discusses approaches to transferring and sharing risks, and addresses the limitations to risk transfer.

I. CATEGORIES OF RISKS

Transit projects and services entail a large number of risks, some of which are listed in the nearby table. Traditional procurement leaves most of those risks on the transit agency. P3s can shift risks so they are shared between public and private parties or borne by the private party completely.

Finding the best allocation of risk between the public and private sector is complex. It depends on understanding which party can most cost effectively bear the risk. For example, design and construction risk are often borne by the private sector in a P3, for the reasons discussed earlier. Environmental approvals such as the [National Environmental Policy Act \(NEPA\)](#), on the other hand, are almost completely out of the private sector's control. Asking the private sector to bear that risk would likely squelch private interest in a project, or alternatively, drive the price of attracting private participation through the roof.

14. World Bank, "Railway Station Redevelopment Guidebook"; Sakaki, "Railway Station Redevelopment: Case Studies in Japan."

TABLE II-I: Risk Allocation - Transportation Infrastructure P3s

Who bears what risk when transportation infrastructure is delivered?

Risk	Design-Bid-Build (DBB)	Design-Build (DB)	DBFOM-P3 Availability payment	DBFOM-P3 Demand r
Scope changes (owner requested)	Public	Public	Public	Public
Environmental approvals	Public	Public	Public	Public
Permits and Approvals	Public	Shared	Shared	Shared
Right of way	Public	Public	Shared	Shared
Utility relocation	Public	Shared	Shared	Shared
Design (errors & omissions)	Public	Shared	Private	Private
Ground conditions	Public	Public	Shared	Shared
Environmental contamination	Public	Shared	Shared	Shared
Construction (cost/schedule overruns)	Shared	Private	Private	Private
Labor disputes	Public	Private	Private	Private
Quality assurance/control	Public	Shared	Private	Private
O&M + Lifecycle	Public	Public	Private	Private
Financing	Public	Public	Private	Private
Changes in law	Public	Public	Shared	Shared
Government competition	Public	Public	Shared	Shared
Force majeure	Public	Shared	Shared	Shared
Traffic & revenue	Public	Public	Public	Private
Toll collection	Public	Public	Public	Private

SOURCE: Adapted from Virginia Office of Public-Private Partnership & CINTRA

BOX II-2: COVID-19 & P3s

How would a P3 handle 2020’s COVID-19 pandemic?

That story is still unfolding as of this writing. Most concession agreements have likely not specifically mentioned a pandemic as a specific risk. Some P3s have requested relief under their agreements’ provisions for handling a change in law, or provisions for handling disruptions to labor and construction because of emergencies declared by a state or federal government. P3s might also request relief under the provisions of a force majeure (i.e. an “act of god”) clause. The relief might take the form of the owner deferring a P3’s delivery deadline, or the owner absorbing some or all of the costs resulting from the event. If the owner and the P3 cannot agree on the relief, the contract would stipulate how to resolve disputes, for example by engaging a mediator and/or a dispute resolution board or a court.

2. APPROACHES TO TRANSFERRING & SHARING RISKS

The actual transfer of risks varies by project. Every concession agreement is different, and each risk needs to be addressed specifically. For example, the risk of construction cost and schedule overruns might be handled in a design-build P3 by establishing a fixed allowable construction cost and delivery date for substantial completion.

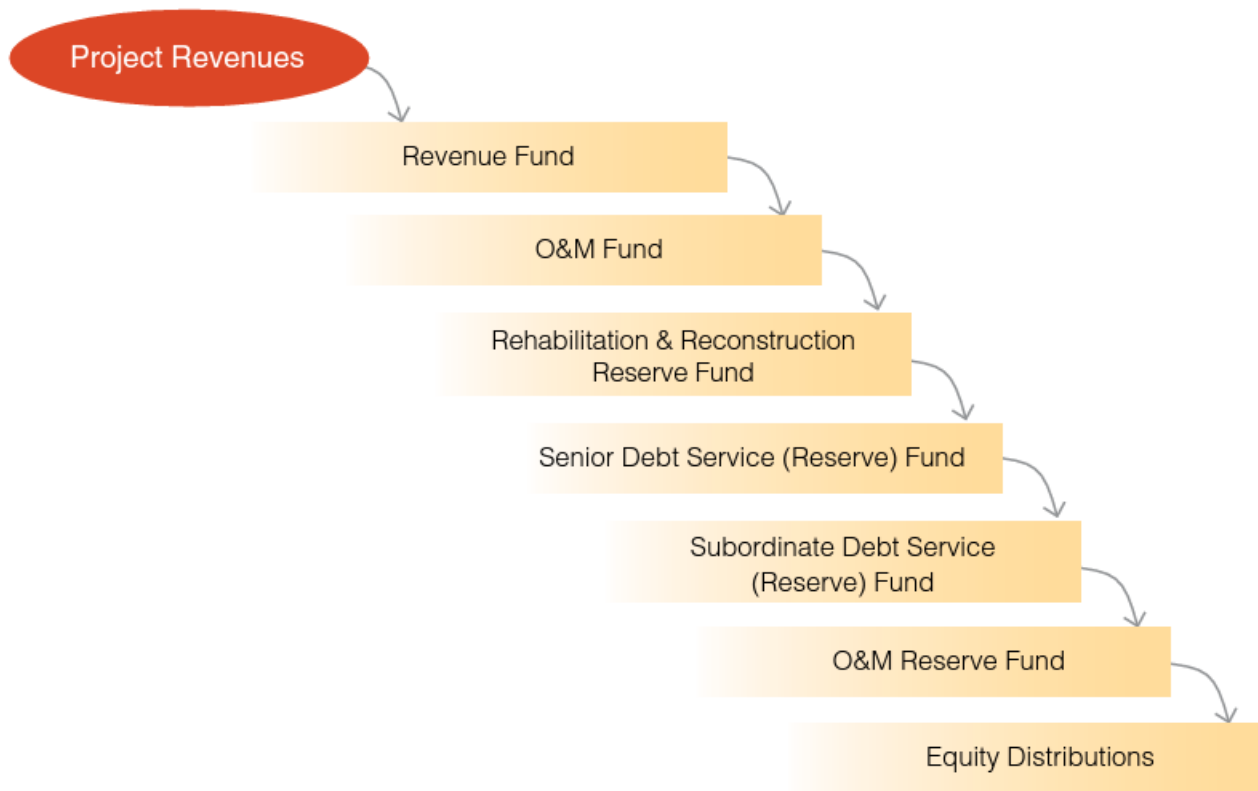
- **Construction Costs:** Claims for additional construction costs would only be paid if they arose from a risk that had been retained by the transit agency, such as risks associated with the discovery of historic remains or hazardous materials in the right of way. Or the concessionaire may absorb cost overruns for particular risks up to a threshold dollar amount. For overruns beyond the threshold, the state may absorb 100% of the cost, or split the cost 50-50 with the concessionaire.
- **Schedule:** The concession agreement might establish a deadline date for substantial completion. Any slippage beyond that date would incur penalties. In some cases, early completion might provide incentive payments.

From the concessionaire's standpoint, such penalties and incentives provide a powerful incentive to deliver on budget and on time. The concessionaire is a free-standing financial entity, capitalized by cash contributions from equity investors and loans. The repayment of the loans and the returns to the equity investors depend on the cashflow of the project. For transit projects, that almost always involves payments from the transit agency. If the project fails to meet one of its targets and the agency levies a financial penalty, that penalty flows directly to the bottom line of the concessionaire. Equity investors are last in line to be paid, after direct costs to the project and debt service to lenders. As a result, every penalty redounds directly to the equity investor's returns.

The "cashflow waterfall" puts this risk transfer mechanism into effect. A typical cashflow waterfall for a project that has completed construction is illustrated in the nearby figure. In the case illustrated here, project revenues (i.e. availability payments) are received by the concessionaire and deposited into a revenue fund. The first call on the revenue fund is the operations and maintenance (O&M) of the project. Once O&M expenses have been covered, remaining revenue is used to contribute an agreed amount into a rehabilitation and reconstruction fund, which will be used for periodic maintenance. Remaining funds are then used to pay down debt and contribute to debt service reserve funds. So-called senior debt has the first call on these funds, followed by subordinate debt. In this example, remaining funds are then used to contribute an agreed amount into an O&M reserve fund. Finally, the concession company owners receive any remaining funds as dividends on their equity investments.

The important point about the cashflow waterfall is that equity gets paid last, and only when O&M, debt service and reserves have been fully funded. This financial structure provides an intense incentive for the concessionaire to ensure efficient operations in full compliance with the key performance indicators in the concession agreement. If there is a performance shortfall and the transit agency docks the availability payment, for example, the equity investors will be first in line to lose their income. Other financial obligations further up the waterfall do not suffer proportionally. They will be fully funded unless the funding shortfall that downstream obligations have been fully extinguished.

FIGURE II-1: Typical P3 Cashflow Waterfall



SOURCE: U.S. Department of Transportation, Federal Highway Administration. “Financial Structuring and Assessment for Public-Private Partnerships: A Primer,” December 2013, p. 11, https://www.fhwa.dot.gov/ipd/pdfs/p3/p3_primer_financial_assessment_1213.pdf.

The P3 financial structure gives the equity investors “skin in the game.” It focuses intense managerial attention on successfully extinguishing risks and delivering projects in compliance with the concession agreement.¹⁵ Equity investors sometimes detail several of their own personnel onsite during high-risk periods such as construction to attend key meetings and review key decisions. Such personnel are not paid by the concessionaire, but rather by the equity investors themselves.

The P3 structure also protects the transit agency if a project does fail and becomes insolvent. In such cases, the P3 company may declare bankruptcy or seek renegotiation of its contract. Renegotiation involves a reopening of the contract with the consent of the P3 and the owner to address problems with the project—say a large cost overrun or the financial failure of one of the concessionaire subcontractors. This may involve the owner being asked to relax deadlines or increase project contributions—i.e. “bailing out” the project.

If the concessionaire becomes insolvent (i.e. has liabilities that exceed its assets, including the future cashflows from the owner’s future availability payments), then the equity owner can “walk”—abandon its equity investments—and turn the project over to the lenders. In such a case, the lenders would typically hire a new company to operate and maintain the project in accordance with the provisions of the concession agreement in order to continue the flow of availability

15. Esty, “Why Study Large Projects? An Introduction to Research on Project Finance,” 217.

payments. Two examples of P3s where this occurred are both toll roads, the Pocahontas Parkway in Richmond, Virginia, and Texas State Route 130 segments 5 and 6.¹⁶

A third option is for the P3 to enter Chapter 11 bankruptcy. Under bankruptcy, the claimants on the P3—say, unpaid vendors and lenders—could be put on hold while the bankruptcy court determines if the concessionaire is viable if the equity is written off and some of the lenders are given a “haircut,” that is, had their debts written down, potentially to zero.

In any of these three cases, the concessionaire would continue to operate. If the project had entered revenue service, the service would continue to operate uninterrupted by the insolvency, because project operations would have first claim on all revenue, before lenders and equity holders. Only if a project was so seriously insolvent that it could not even proceed with all of its equity and debt written off would it then be dissolved, and the assets liquidated. This would be an extremely rare outcome since it would be very hard at the outset to attract equity investors or lenders to a project that had such a weak financial basis.

3. LIMITATIONS TO RISK TRANSFER & SHARING

Procurement through a P3 does not transfer all risks to the private sector. Indeed, the more risk transferred to the private sector, the greater the returns the private sector will require to undertake the project. What P3 procurement does generally achieve, however, is more explicit and transparent disclosure of risk at the beginning of a project. An equity investor or lender to a P3 concession company has a strong incentive to understand the risks involved at the outset and to have a clear allocation of those risks between the owner and the concessionaire.

This explicit risk assessment and allocation should generally help all parties understand the total cost of the project. Under traditional procurement, important risks retained by the public sector are often not priced or highlighted and hence, not apparent to decision makers. Project advocates at times prefer that some risks not be explicitly priced on the philosophy that once an agency begins a project, it is hard to abandon it even if risks materialize that were not built into the original disclosed cost estimates. Some risks, such as delays arising from obtaining NEPA approvals or acquiring right of way, are typically retained by the owner because the private sector has virtually no control over the risk and would require very high returns to shoulder it.

Transit agencies need to exercise care in figuring out which risks can be borne cost effectively by the private sector, which are more suitable to be retained by the agency, and which can effectively be shared. To achieve that, a successful procurement will generally require extensive discussions with the private sector during the procurement on risk allocation issues. Moreover, the transit agency has a strong interest in ensuring a financially successful project for itself and the private sector. It is a partnership, where both the public and the private entities have a mutual stake in the success of the other.

16. U.S. Department of Transportation, Build America Bureau, “Pocahontas Parkway / Richmond Airport Connector”; Bolaños et al., “U.S. Surface Transportation Public-Private Partnerships.”

D. P3 FUNDING & FINANCING

One of the most widely known—and widely misunderstood—features of P3s is their financing capability. For some agencies, interest in P3s arises when all other alternatives have been exhausted. “We don’t have enough money for this project, so let’s do a P3.” For better or worse, this is not how P3s work.

P3s do not create money in public transit or anywhere else. Public transit typically requires taxpayer support for capital and operating expenses. Those taxes may be from the transit agency’s jurisdiction (a city or county or special district), or grants from the state or federal government (and hence, their taxpayers).

What P3s can do is provide access to financing. What do we mean by financing? Financing is a mechanism for expending funds today in exchange for cashflow expected in the future. A home mortgage is a form of financing, whereby a bank lends to a homeowner for the purchase of a home today in exchange for the promise of repayment with interest over the term of the loan.

P3 financing comes in two forms: loans and equity investments. A loan is an agreement between a lender and a borrower for the lender to provide a sum of money in exchange for a promise to repay it in the future with interest.¹⁷ The borrower uses the loan and proceeds to carry out some project—building a new transit line or refurbishing an existing line, for example. In transit projects, funds to repay the borrower usually come from taxes paid over the course of the term of the debt, from several years up to several decades. The federal government provides several resources that can be used for public transit P3s, as discussed in Appendix A.

In addition to loans and equity investments, transit projects also sometimes generate sufficient project revenue to contribute significantly to project financing. Project revenues may come from the farebox, or may arise from “value capture,” that is, revenue generated by the increased land value arising from the construction of a transit project. A discussion of value capture is included in Appendix A.

E. INSTITUTIONAL ARRANGEMENTS

Transit agencies use a variety of institutional arrangements to support their P3 efforts. The arrangement that is best for the Massachusetts Bay Transportation Authority (MBTA) will depend very much on its institutional context. Typically, agencies use some combination of in-house staff and on-call advisers who can be brought in to support a particular project or effort. Transit agencies use a variety of institutional arrangements to support their P3 efforts. The arrangement that is best for the Massachusetts Bay Transportation Authority (MBTA) will depend very much on its institutional context. Typically, agencies use some combination of in-house staff and on-call advisers who can be brought in to support a particular project or effort.

17. Leave aside the negative interest rates on some sovereign debt of recent years, which is not relevant to P3s.

PEER AGENCY: LESSONS LEARNED

The following case studies provide an overview of how transit agencies have used public-private partnerships (P3) in a variety of ways. Three case studies of rail systems are presented: Maryland's Purple Line, Denver's Eagle P3; and Toronto's Mextrolinx. Two case studies of transit station projects illustrate how P3 concepts have been applied in that context.

A. RAIL

I. PURPLE LINE (MARYLAND)

Maryland's Purple Line is an example of using a P3 for the delivering a new suburb-to-suburb commuter rail line. The project grew out of plans for expanded suburban transit service to complement the Washington Metro's largely radial network structure. The project reached financial close as a P3 in 2016. However, the project has encountered significant delays and cost overruns due in large part to a surprise order by a federal judge to suspend the project's federal Record of Decision (ROD), which is required under the National Environmental Policy Act (NEPA). The project is on the brink of being dissolved and taken over by the state. The case illustrates both the potential benefits and limitations of the P3 approach for a transit megaproject.

The project is a 16-mile, 21-station commuter rail line on new alignment currently under construction in the Maryland suburbs of Washington, D.C. The vision of the project is to provide a cross-county circumferential transit option to support suburb-to-suburb commuting, which is increasingly common. The completed line will serve five major activity centers and connect with three radial lines of the Washington Metrorail system, three commuter rail lines operated by the state of Maryland, and Amtrak, as well as local bus lines.

The financing for the design and construction (D&C) of the project is shown in the nearby table. The total D&C cost was \$2.4 billion. The state of Maryland supported 37% of the D&C costs, using, in addition to its own funds, federal "new starts" funds, contributions from the counties where the project is located and a contribution from the University of Maryland, which will be served by the project. The balance of the D&C cost was financed with 6% equity and 58% debt, through private activity bonds (PABs) and the Transportation Infrastructure Finance and Innovation Act (TIFIA). The bulk of the D&C cost, 86%, was for the design, construction and operation of the project during the 5-year period of construction. The remaining 14% was mostly for debt service during construction (12%), development costs (1%), which include the cost of issuing the bonds, and pre-funding required reserve accounts for the project during the 30-year operating period (1%).

In addition, the state committed to pay an availability payment for 30 years during the operating period. The average amount of the payment is \$141 million per year in current dollars, or \$75 million per year in present value terms. The present value of the full 30-year availability payment stream was \$2.3 billion.¹⁸

18. Estimated using 3% discount rate to 2016, Maryland Economic Development Corporation (Purple Line Light Rail Project), "Private Activity Revenue Bonds Official Statement," 207.

TABLE III-I: Sources & Uses of Funds During Design & Construction of the Purple Line Light Rail Project

SOURCES OF FUNDS DURING DESIGN & CONSTRUCTION	AMOUNT	PERCENT
GOVERNMENT SUBSIDY	\$890,000	37%
DEBT		
PABS	\$474,117	20%
TIFIA	\$925,315	38%
EQUITY	\$138,481	6%
TOTAL	\$2,427,913	100%

USES OF FUNDS DURING DESIGN & CONSTRUCTION	AMOUNT	PERCENT
DEVELOPMENT COSTS	\$37,958	2%
DESIGN BUILD COSTS	\$2,009,874	83%
O&M DURING CONSTRUCTION	\$44,434	2%
COMPANY COSTS DURING CONSTRUCTION	\$22,849	1%
DEBT SERVICE DURING CONSTRUCTION	\$281,934	12%
FUNDING RESERVE ACCOUNTS	\$30,864	1%
TOTAL	\$2,427,913	100%

SOURCE: Maryland Economic Development Corporation (Purple Line Light Rail Project), “Private Activity Revenue Bonds Official Statement,” June 4, 2016, pp. 200-201.

The total current dollar cost of the project as approved by the Maryland Board of Public Works on April 6, 2016, was \$5.59 billion.¹⁹ Maryland entered into the project with an expectation of the U.S. Federal Transit Administration’s (FTA) “New Starts” full funding agreement of \$900 million, which it subsequently received.

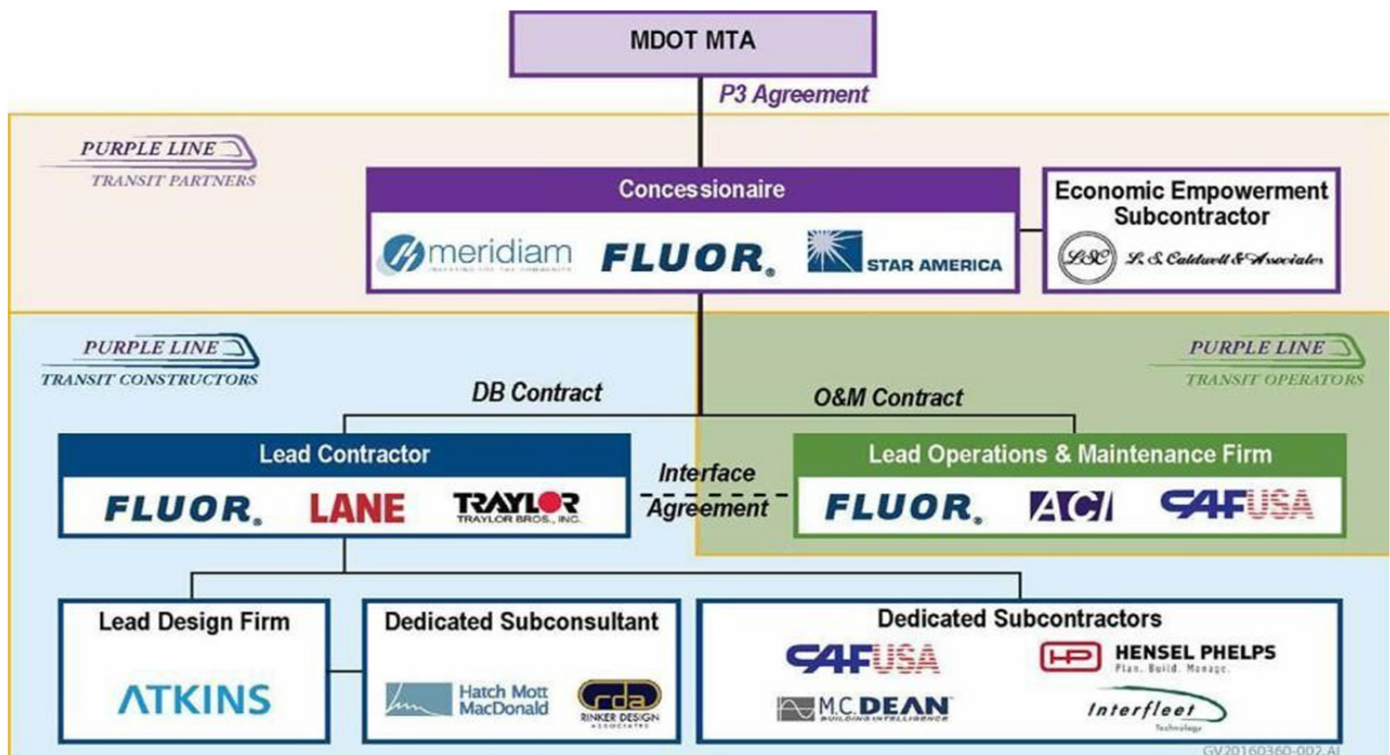
19. Estimated using 3% discount rate to 2016, Maryland Economic Development Corporation (Purple Line Light Rail Project), “Private Activity Revenue Bonds Official Statement,” 207.

The structure of the P3 arrangements is illustrated in the nearby organizational chart. Maryland Department of Transportation Maryland Transit Administration (MDOT MTA) is the owner, which entered into a concession agreement with Purple Line Transit Partners (PLTP), the concessionaire. PLTP is a freestanding company owned by three companies: Meridiam (70%), Fluor (15%), and Star America (15%). Meridiam is a French investment and asset management company that operates in Europe and North America. Fluor is a U.S.-based global engineering, construction and maintenance company. Star America is a developer, investor and manager of infrastructure projects in North America.

Concessionaire PLTP has two principal contracts, a design-build (DB) contract and an operation and maintenance (O&M) contract. The design-build contract is with Purple Line Transit Constructors (PLTC) and the O&M contract is with Purple Line Transit Operators (PLTO). DB contractor PLTC consists of three lead contractors: Fluor, Lane and Traylor Brothers. The O&M contractor PLTO consists of three O&M firms: Fluor, ACI and CAF USA.

Thus, Fluor has a role as an owner of the concessionaire, PLTP, one of principal design-build firms, and an O&M firm. CAF USA is the U.S. subsidiary of global transit equipment provider CAF and participates in the design-build process to provide equipment and in the O&M contract to provide new equipment on an ongoing basis.

FIGURE III-1: Typical P3 Cashflow Waterfall



SOURCE: Maryland Department of Transportation, Maryland Transit Administration, “Public-Private Partnership (P3),” MDOT MTA Purple Line, accessed July 29, 2020, <https://www.purplelinemd.com/about-the-project/p3>.

The Purple Line is currently under construction. However, as of March 2021, the project is undergoing a major restructuring. The project encountered significant delays early on due to a lawsuit from local project opponents that led a federal judge to suspend the federal ROD under

the National Environmental Policy Act (NEPA). Litigants had questioned the demand forecasts in the NEPA documents because of declining demand on the Washington Metro system, with which the Purple Line will interconnect. The appeals court later reinstated the record of decision, but the matter led to cost overruns and delays that are now in dispute between the concessionaire and the owner. The P3 consortium gave notice of its intent to terminate the project unless the dispute could be resolved. Subsequently, Maryland contributed an additional \$250 million to the project and the design-builder in the P3 consortium withdrew from the project. The P3 consortium is currently evaluating proposals from new design-build partners, with a selection expected in June 2021. Meanwhile, the state Department of Transportation (DOT) has taken over some subcontracts to keep utility relocation and rail car production moving forward.²⁰

The Purple Line project illustrates how an agency has used the P3 approach to advance a project and transfer construction and O&M risk to a concessionaire company. However, the project also illustrates the limitations of risk transfer, particularly risk transfer for environmental permitting. Clearly, one of the key risks in this project is responsibility for delays in obtaining and retaining environmental permits in the form of the federal ROD that allows the project to proceed. This environmental permitting risk is usually the responsibility of the transit agency. If that permit is delayed, or as in the case of the Purple Line, suspended, the consequences for a multi-billion-dollar project can be devastating.

One clear lesson from the Purple Line is that delivering such megaprojects under the U.S.'s litigation-oriented system of environmental permitting is a major project risk. A P3 concession agreement for such a project should be extremely clear about which party bears this risk and the consequences if the risk materializes and leads to project delays or changes.

2. EAGLE P3 PROJECT (DENVER)

The Eagle P3 project in greater Denver is a new commuter rail system, 35 miles in length, including rolling stock and a maintenance facility. The system includes a 23-mile line from the historic downtown Denver Union Station (see case study in section B.1) to the Denver International Airport (the A line), and two shorter lines totaling 12 miles in length serving suburbs north and west of the city (the B and G lines). The project also includes a Commuter Rail Maintenance Facility.

The project includes design, construction, financing, operations and maintenance for 34 years, including five years of design and construction. The project reached financial close in 2010, just following the 2008/2009 global financial crisis, which added significant complexity to arranging its financing. The total value of the deal in was \$2.1 billion (2010 dollars), which was \$300 million less than the Regional Transportation District's (RTD's) internal estimates.²¹

RTD received substantial federal support for the project, with an FTA full funding agreement of \$1.03 billion and a TIFIA loan of \$280 million. The funding package also included \$128 million in regional RTD.^{22, 23}

20. Shaver, "Firms Managing Purple Line Construction Narrow List of Potential New Contractors."

21. Williamson, "Denver on the Fast Track to Finish Rail Link to Airport"; Cho, Long, and Parsons, "Infrastructure Investors Are Willing to Pound the Pavement"; Regional Transportation District, "Eagle P3 Project Procurement Lessons Learned."

22. & 23. U.S. Department of Transportation, Federal Highway Administration, Center for Innovative Finance Support, "Project Profile: Eagle Project." U.S. Department of Transportation, Federal Highway Administration, Center for Innovative Finance Support, "Project Profile: Eagle Project."

TABLE III-2: Sources & Uses of Funds During Design & Construction of the Eagle Project

SOURCES OF FUNDS DURING CONSTRUCTION	AMOUNT	PERCENT
CONSTRUCTION PAYMENTS	\$1,139,110	69.5%
SERIES 2010 BOND PROCEEDS	\$396,118	24.2%
EQUITY	\$54,250	3.3%
SERVICE PAYMENTS	\$44,040	2.7%
INTEREST INCOME	\$4,486	0.3%
TOTAL SOURCES OF FUNDS	\$1,638,004	100.0%
USES OF FUNDS DURING CONSTRUCTION	AMOUNT	PERCENT
CONSTRUCTION EXPENDITURE	\$1,269,197	12%
INTEREST DURING CONSTRUCTION	\$151,483	12%
COMPANY OVERHEAD	\$51,520	12%
PROJECT COSTS NOT INCLUDED IN CONSTRUCTION EXPENDITURES	\$57,082	12%
OPERATING COSTS	\$74,870	12%
INSURANCE	\$6,045	12%
COSTS OF ISSUANCE	\$3,382	12%
EQUITY LETTER OF CREDIT FEES	\$5,038	12%
DEBT SERVICE RESERVE ACCOUNT	\$16,389	12%
INDENTURE CHANGE IN LAW CONTINGENCY ACCOUNT	\$3,000	12%
TOTAL USES OF FUNDS	\$1,638,004	100%

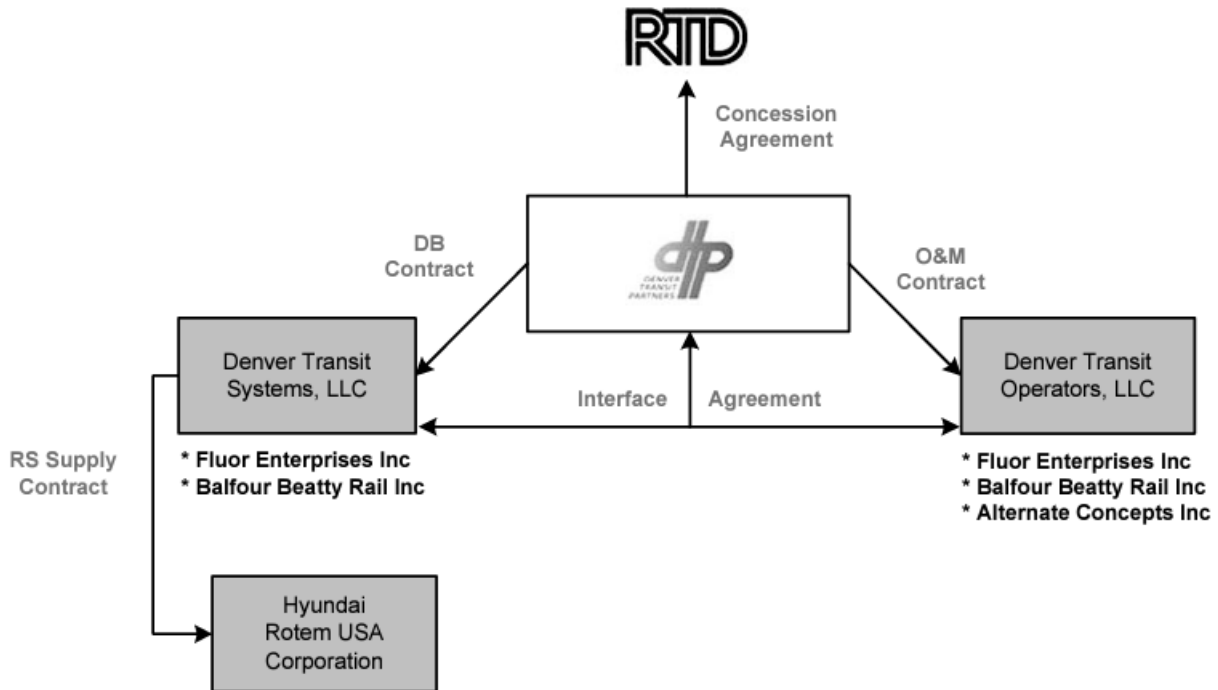
SOURCE: Regional Transportation District (Colorado), “Official Statement Relating to \$397,835,000 Regional Transportation District (Colorado) Tax-Exempt Private Activity Bonds (Denver Transit Partners Eagle P3 Project), Series 2010,” August 4, 2010, p. 25, <https://emma.msrb.org/EA402484-EA315069-EA710776.pdf>.

The structure of the P3 is illustrated in the nearby organizational chart. The project owner is the Regional Transportation District of Colorado, a regional body for the Denver area, governed by an elected board. Denver Transit Partners (DTP) is a special purpose company created to design, build, operate, and maintain the Eagle P3 project. Ownership of DTP is held by Fluor (10%),

Uberior Infrastructure Investments (No 4) Limited (45%, an investment fund managed by the Bank of Scotland), and John Laing Investments Ltd. (45%, an investment fund specializing in infrastructure delivery based in London).²⁴

DTP holds a design-build contract with Denver Transit Systems, LLC, a joint venture between Fluor and Balfour Beatty Rail, Inc. Hyundai Rotem USA Corp. is the rolling stock provider. DTP has a separate O&M contract with Denver Transit Operators, LLC, a joint venture between Fluor, Balfour Beatty and Alternate Concepts.

FIGURE III-2: Structure of Partners of the Eagle P3 Project



SOURCE: Regional Transportation District (Colorado), “Official Statement Relating to \$397,835,000 Regional Transportation District (Colorado) Tax-Exempt Private Activity Bonds (Denver Transit Partners Eagle P3 Project), Series 2010,” August 4, 2010, p. 12, <https://emma.msrb.org/EA402484-EA315069-EA710776.pdf>

The airport line (A line) and one of the other two lines (the B line) opened ahead of schedule in 2016. The third line (the G line) opened in 2019. Startup operations on the A and B lines were generally smooth. However, a contentious issue arose over at-grade crossing gates, which complicated operations on the A and B lines and delayed the start of service on the G for three years. DTP was required to provide human grade crossing guards on the A and B line for more than two years. RTD also reduced the availability payment to DTP by \$250,000 per month for the A line and \$100,000 per month for the B line, again for more than two years, until the U.S. Federal Railroad Administration (FRA) and the Colorado Public Utilities Commission were satisfied with the grade crossing system’s performance.²⁵

24. Macquarie, an Australian investment management firm held 90% of the equity until financial close, at which point it sold its interest to Uberior and John Laing. Regional Transportation District (Colorado), “Official Statement Relating to \$397,835,000 Regional Transportation District (Colorado) Tax-Exempt Private Activity Bonds (Denver Transit Partners Eagle P3 Project), Series 2010,” 32–33, 86–87.

25. “Denver Transit Partners, LLC vs. Regional Transportation District, Complaint and Jury Demand,” 11, 13; “Denver Transit Partners, LLC, vs. Regional Transportation District, Defendant Regional Transportation District’s Counterclaims and Answer to Complaint,” 24–25.

The grade crossing system in question was the first of its kind. RTD had required the use of the grade crossing components of the Positive Train Control (PTC) system being implemented nationally under mandate from the FRA. DTP and RTD are at odds over whether the delays are allowed under the concession agreements “change of law” provisions. DTP has filed suit against RTD. The jury trial concluded in October 2020, and the expected outcome of the litigation is expected late in 2021. However, despite the litigation, the concessionaire received its last “Final Completion Certificate” on November 16, 2020, which formally concludes the construction phase of the project.²⁶

The Eagle P3 project illustrates the potential value of the P3 approach for delivering a complex new commuter rail system at a committed cost \$300 million less than the owner’s original estimates. The A and B lines began operation on time in 2016 and have been operating successfully. However, both lines have operated with unanticipated measures and costs related to their grade crossing controls. The grade crossing issue also delayed the opening of the G line for three years until 2019. The grade crossing issue has been a major challenge for the project, with RTD and DTP significantly at odds over responsibility for the delay and headed to a jury trial with hundreds of millions of dollars at stake.

Clearly, issues involving external regulators such as the FRA and the Colorado Public Utilities Commission and the permitting of new technology can pose hazards for a project and deserve careful assessment in the development of successful P3 projects.

3. GO RAIL (METROLINX – TORONTO, ONTARIO, CANADA)

MetroLinx is a regional transit agency for the Greater Ontario (hence, GO) area, which encompasses the Toronto metropolitan area in the province of Ontario, Canada. The Toronto Transit Commission operates bus, subway, streetcar and paratransit services in the city of Toronto.

In November 2018, MetroLinx advanced a proposal called “GO Expansion” to upgrade its commuter rail operations to “Rapid Rail.” The key features of Rapid Rail are that it will typically use electrified trains with faster braking and acceleration and maximum speeds of 120 km/h (75 mph). Rapid Rail would also provide two-way all-day service with high frequencies (typically 15-minute headways or less).²⁷

In April 2019, the premier of the province of Ontario announced the Ontario Line as a “better, faster, smarter” alternative to the system improvements outlined in the GO Expansion plan. In particular, the Ontario Line would replace the Relief Line South, a long-planned expansion of the existing subway system. The Ontario Line would use automated “light metro” technology similar to that used in London’s Docklands Light Railway. The lighter rolling stock and shorter trainsets would allow shorter, cheaper platforms. The ability to climb steeper grades would allow for a mix of above- and below-ground stations. And the automated operation would save significantly on staffing.²⁸

26. Fitch Ratings, “Fitch Expects to Rate RTD (CO)’s Eagle P3 Series 2020 PABs ‘A-’; Outlook Stable”; Williamson, “Denver Commuter Rail P3, Now Fully Operational, to Refund Launch Debt.”

27. MetroLinx, “GO Expansion Full Business Case.”

28. Ontario, Ministry of Finance, “The New ‘Ontario Line’ -- Better, Faster, Smarter.”

The Ontario Line was a significant departure from the long-term transportation plans for the region and was developed rapidly in the first year of the Ontario premier's government. The proposal was the source of some controversy in the region. A related issue was the proposed "upload" of the Toronto Transit Commission's responsibilities from the city to the provincial level. The proposed upload ultimately did not move forward.²⁹

The provincial bodies Metrolinx and Infrastructure Ontario released the initial business case for the line in July 2019. The initial business case is part of a mandated business case evaluation process used by Metrolinx for all capital projects. The initial business case evaluates the investment from four perspectives compared to "business as usual": (1) the strategic case, which focuses on how it fits with regional development goals, plans, and policies; (2) the economic case, which applies cost-benefit analysis to assess overall societal impact; (3) the financial case, which assesses the financial impact, funding, and value for money; and (4) the deliverability and operations case, which examines procurement options, deliverability risks and operations, and maintenance risks.

Projects that progress from the initial business case then go on to a preliminary design business case, which is used to secure provincial funding and occurs in parallel with the environmental assessment process. Next is the full business case, which is used to prepare the project for procurement. Finally, a post in-service business case reviews actual cost and performance and provides lessons learned and opportunities for enhancing service.³⁰

The Ontario Line's initial business case found the project to be favorable when compared to a "business as usual" case of the planned Relief Line South, as summarized in the nearby figure. The capital cost for the Ontario Line is estimated at C\$8.7 to C\$10.5 billion if delivered as a P3, as the government proposed, versus C\$6.2 - C\$7.5 billion for the Relief Line South, which would not work as a P3 because it would not be easily separated from the existing commuter rail system. The greater capital cost of the Ontario Line is offset, however, by a higher benefit-cost ratio, in the range of 0.90 to 0.96 for the Ontario Line as a P3 versus 0.48 to 0.55 for the Relief Line South.

29. Spurr, "How Ford's Ontario Line Plan Came Together in Just Three Months - with Secrecy, a Shifting Route and a Consultant"; Star, "Mayor Backs Deal with Province on Subways; City Would Endorse Ontario Line, Scarborough Plan as Queen's Park Cancels Upload."

30. Infrastructure Ontario and Metrolinx, "Ontario Line Initial Business Case," 9, 15-16.

BOX III-I: Business Case of the Greater Ontario Expansion Project

	Relief Line South	Ontario Line
Sustainable and Healthy Communities	<ul style="list-style-type: none"> 10,000 net new transit users in the morning peak hour³ compared to BAU 28,000km decrease in VKT⁴ compared to BAU Reduction in auto-related GHG emissions of 825,000 tonnes annually (2.6% reduction) compared to BAU The tunneled alignment helps with limiting impacts to the natural environment, public realm and quality of life. 	<ul style="list-style-type: none"> 18,000 net new transit users in the morning peak hour compared to BAU 83,000km decrease in VKT compared to BAU Reduction in auto-related GHG emissions of 1,012,000 tonnes annually (3.2% reduction) compared to BAU The elevated/at-grade portions of the line may present visual and environmental impacts that will need to be mitigated.
Economic Case		
Total Economic Benefits (\$2019, Net Present Value (NPV))	\$3.4 billion	\$7.4 billion
Total Costs (\$2019 NPV)	\$8 to \$9.2 billion	\$10.4 to \$12 billion
Fare Revenue Adjustment (\$2019 NPV)	\$993 million	\$1,761 million
Benefit-Cost Ratio (NPV)	0.48 to 0.55	0.76 to 0.88 with a standard delivery model; 0.90 to 0.96 with P3 delivery.
Financial Case		
Capital Costs (\$2019)	\$6.2 - \$7.5 billion	\$9.5 to \$11.4 billion
Capital Costs (\$2019), adjusted for P3 Delivery	N/A	\$8.7 to \$10.5 billion
Operations Costs (NPV, \$2019)	\$1.7 billion	\$1.9 billion
Deliverability and Operations Case		
Procurement and Delivery	<ul style="list-style-type: none"> Designed as a fully compatible expansion of the existing subway network, building on current system assets, which limits the range of options for delivery 	<ul style="list-style-type: none"> Developed with the potential to be a freestanding line from a systems and standards perspective, which opens up the possibility of Public-Private Partnership (P3) delivery and driving cost and schedule adherence

SOURCE: Infrastructure Ontario, and Mextrolinx. "Ontario Line Initial Business Case," July 2019, 11. Note: all figures in Canadian dollars.

Procurement of the Ontario Line began in 2020 using a design-build-finance-maintain (DBFM) P3 approach. The procurement is divided into three contracts. The first includes rolling stock, systems, operation and maintenance (RSSOM). The second and third contracts include the civil, stations and tunnel contracting for the southern and northern segments of the project. The Requests for Qualifications (RFQs) for the RSSOM and the southern civil, stations and tunnel were issued in June 2020. Invitations to qualified teams to respond to requests for proposals (RFPs) are expected in fall 2020. The requests for information (RFIs).^{31,32}

The Ontario Line represents the use of the P3 approach to pursue delivery of a new type of rail service—“better, faster and smarter,” in the words of the provincial authorities promoting it—to serve the greater Toronto metropolitan region. The proposed project leverages the P3 approach to introduce a light metro technology into the Toronto regional transit system. It builds on Canada’s tradition of using P3s, where the procurement approach is much more widely used than the U.S. The project also illustrates the use of the Canadian project development approach using business case analysis. The procurement itself is still in its early stages.

B. STATION

I. DENVER UNION STATION³³

Denver Union Station (DUS) is an historic railroad station near Denver’s central business district that has become the hub of a new, mixed-use, transit-oriented development (TOD) district. The redevelopment of the station and surrounding land is the product of a public-private partnership between the City of Denver, the Regional Transportation District (a special purpose transit operator governed by an elected board), and private developers. The project grew out of long-term planning begun in the 1990s that envisioned the redevelopment of a former railroad switching and storage yard behind the station. The project encountered major obstacles resulting from the global financial crisis of 2008/2009, but reached successful completion and build out ten years earlier than anticipated and received the 2015 Global Awards for Excellence from the Urban Land Institute.

A complex mix of five public and private partners were responsible for developing the project, using nine different funding sources. The City of Denver (formally the City and County of Denver) was the primary entity guiding the vision and implementation of the project, commensurate with its ability to provide capital and guarantee bonds. The City and three partner public agencies established the Executive Oversight Committee to coordinate project management and select a master developer.

The master plan for the project envisioned significant private sector investment in the land from the former rail yard behind the station, as well as guidance in the vision and management for the entire project. The use of a single master developer would help ensure well integrated connections between the transit facilities and services, public spaces, and the private buildings and amenities in the wider station area.

31. & 32. Briginshaw, “First Two RFQs Issued for Toronto’s Ontario Line”; Railway Gazette International, “Ontario Line PPP Procurement Starts.”

33. This case study draws significantly on Good, “Railway Station Redevelopment Guidebook: Case Study - Denver Union Station.”

The 18-month search process began in June 2005 with a request for qualifications (RFQ) that yielded eleven interested teams. A two-part request for proposals (RFP) invited five teams initially and ended up with two teams given final consideration in public presentations in September 2006. The winning consortium included SOM as the architect and master planner, Kiewit as the primary contractor, AECOM as the transit engineer, and Hargrave & Associates as the landscape planner. The winning consortium also benefited from having effective control over many of the sites behind the station that were in private hands.

A newly created Denver Union Station Project Authority (DUSPA) was established in 2008. It included representatives from each government entity involved, with the City of Denver holding the most seats (eight members, six voting and two non-voting), RTD holding two members, and one member each from the Colorado DOT, the Denver Regional Council of Governments and the Metropolitan District.

The master development agreement included options for the master developer to acquire sites owned by the City of Denver and RTD. The options included fixed prices for the sites that expired on future dates, which gave the master developer flexibility in its financial plan. Other key elements of funding included the formation of five special taxing districts to cover the 19.5-acre section of publicly held land and the creation of the Denver Downtown Development Authority (DDA), which had tax increment powers over the 40-plus-acre area around the station, including privately held parcels. The project also received federal support with grants from USDOT and through the American Reinvestment and Recovery Act (ARRA), as well as loans through TIFIA and RRIF.

TABLE III-3: Sources of Funding of the Denver Union Station Project

FUNDING SOURCE	AMOUNT	PERCENT
TIFIA LOAN	\$145,600	30
RRIF LOAN	\$155,000	32
FHWA GRANT	\$45,300	9
FTA GRANT	\$9,500	2
ARRA STIMULUS GRANT	\$28,400	6
DEPARTMENT OF HOMELAND SECURITY GRANT	\$353	<1
RTD	\$65,100	13
OTHER STATE & LOCAL FUNDS	\$19,900	4
LAND SALES	\$18,400	4
TOTAL	\$487,700	100

SOURCE: U.S. Department of Transportation, Federal Highway Administration. "Project Profile: Denver Union Station." FHWA - Center for Innovative Finance Support - Project Profiles. Accessed October 14, 2020. https://www.fhwa.dot.gov/ipd/project_profiles/co_union_station.aspx.

The design concept of the project evolved significantly from the 2004 Master Plan to the project as finally realized. Major changes included relocation of bus exchange in order to keep the project within budget. The parties used a Citizens Advisory Committee to explore and ultimately settle on the final design. Construction of the new transit facilities involved the temporary relocation of the Amtrak station to a temporary platform at nearby Coors Field.

Redevelopment of the station building itself was awarded to a separate consortium to convert it into a boutique hotel on the upper floors, with retail and restaurants and retail on the main floor, with the grand station hall serving as the lobby of the hotel, as well as a waiting area for Amtrak and the commuter trains, including the commuter line to the airport constructed separately as part of the Eagle P3 project discussed earlier in this report.

The project as finally completed contains ten acres of urban plazas and open space and over 1.5 million square feet of private mixed-use development. The transit facilities include an eight-track commuter rail facility, a three-track light rail facility, and a 22-bay regional bus facility.³⁴ In 2018, it served approximately 24,000 daily passengers on the two commuter rail and three light rail lines, plus two Amtrak trains. The project has won awards for architecture, urban design and innovative real estate development.

The Denver Union Station project illustrates the importance of two key success factors. First, the project had a nimble and cohesive governance structure that was able to navigate the challenges posted by the financial crisis, which severely affected the original financial plan. Second, by working with a master developer, the project was able to take advantage of development pressures present in the city around the station.

2. SALESFORCE TRANSIT CENTER (SAN FRANCISCO)

San Francisco's Salesforce Transit Center is the primary bus terminal serving the city's downtown area. The project engaged the private sector by selling the naming rights for the center to San Francisco tech firm Salesforce, whose headquarters is across the street and connects to the center with a bridge, for \$110 million. Thus, it is a public-private partnership of a different sort.

The project was originally developed under the name Transbay Transit Center. In 2017, Salesforce purchased the naming rights for 25 years for \$110 million, with a provision that increases its annual contribution by 20 percent when planned rail service to the station begins in the future. The naming rights entail the formal name of the transit center itself, and the naming of the park on the roof of the center as Salesforce Park. The name Salesforce does not appear on the Center's facade or structure. Ownership of the facility itself remains in the public sector. The funds from the sale of the naming rights are used to support the operations and maintenance of the facility.³⁵

The new Center contains a two-block-long bus deck with direct freeway access for service across San Francisco Bay to Treasure Island, Oakland and the East Bay. A ground level bus plaza serves six major city transit lines. Space for a future underground train station has three platforms and six tracks. And a rooftop park is connected with two bridges to Salesforce Tower, the

34. Continuum, "Union Station Project Details."

35. Brinklowsky, "FYI, Salesforce Does Not Own Salesforce Transit Center, Park"; Keeling, "Salesforce Purchases Exclusive Naming Rights to Transbay Transit Center."

headquarters of Salesforce.com, and a mixed-use building on adjacent sites.³⁶ The new Transit Center serves eight Bay Area counties through 11 transit systems.³⁷

The Salesforce Transit Center replaced the 1939 Transbay Terminal, which was originally constructed to serve rail service from the Oakland and the East Bay and converted to a bus terminal when that rail service was discontinued in 1959. The Transbay Terminal was damaged in the 1989 Loma Prieta earthquake, but remained in service until 2010, when it was demolished to make way for what became the Salesforce Transit Center.

The Transit Center was also constructed to accept future rail service for the existing Caltrain commuter rail service serving San Jose and points south, which terminates ten blocks (1.3 miles walking distance) to the south. The Salesforce Transit Center is also configured to serve the future California High Speed Rail. The Transit Center opened with limited service in 2017 and with full service in August 2018. Structural problems led to its closure a month later. It reopened after repairs in July 2019.

The project is being delivered in two phases. Phase 1 includes the construction of the transit center itself, including a “box” for the future underground train station. Total cost for phase 1 was \$2.3 billion, with a very complex set of funding sources as shown in the nearby table. The estimated cost of phase 2 is \$4 billion and includes extension of the Caltrain commuter rail service, for which funding is currently being secured.

36. San Francisco Municipal Transportation Agency, “Salesforce Transit Center.”

37. San Francisco County Transportation Authority, “Salesforce Transit Center.”

TABLE III-4: Sources of Funding of the Salesforce Transit Center Project

SALESFORCE TRANSIT CENTER FUNDING SOURCES	
LOCAL	
San Francisco Proposition K Sales Tax	\$139.3 million
San Mateo County Measure A Sales Tax	\$4.5 million
AC Transit Capital Contribution	\$39.4 million
Lease & Interest Income	\$3.8 million
Transferable Development Rights	\$4 million
Transit Center District Plan (Mello Roos Community Facilities District)	\$146.6 million
Bridge Financing (Loan)	\$154.0 million
City Financing	\$247.5 million
Other Local	\$4.1 million
REGIONAL FUNDING SOURCES	
RTIP	\$10.2 million
Regional Measure 1 (RM-1) Bay Area Toll Bridge Revenue	\$54.4 million
Regional Measure 2 (RM-2) Bay Area Toll Bridge Revenue	\$143 million
AB 1171 (Bay Area Toll Bridge Seismic Retrofitting Legislation)	\$150 million
STATE FUNDING SOURCES	
Land Sales	\$515.6 million
FEDERAL FUNDING SOURCES	
TEA-21 Earmark	\$8.7 million
SAFETEA-LU Earmarks	\$53.5 million
TIFIA Loan	\$171 million
FRA Rail Relocation	\$2.7 million
ARRA High Speed Intercity Passenger Rail	\$400 million
One Bay Area Grant	\$6.2 million
FEMA Grants	\$0.1 million

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Center for Innovative Finance Support. "Transbay Transit Center." Project Profiles. Accessed October 19, 2020. https://www.fhwa.dot.gov/ipd/project_profiles/ca_transbay_transit.aspx.

KEY FINDINGS, RECOMMENDATIONS, CONCLUSION

Public-private partnerships (P3s) are coming into increasing use in the U.S. for public transit project delivery. This report has presented a high-level overview of P3s and discussed the advantages and limitations of P3s in the context of public transit. It outlined the key features and core concepts of P3s for public transit, which include the project evaluation process, options for project scoping, risk assessment and allocation, funding and finance for transit P3s, and institutional arrangements for transit agencies seeking to explore a P3 program. It also presented case studies of five different P3 projects in the U.S. that capture some of the range of available options for public and private cooperation in the public transit arena. Three appendices provide deeper background on funding and financing options for P3s (Appendix A), project evaluation techniques (Appendix B), and how to explore and establish a P3 program (Appendix C).

As the [Massachusetts Bay Transportation Authority](#) (MBTA) assesses whether and how P3s might contribute value for money to its mission, as well as understanding their limitations, it should take into consideration the following recommendations.

- **Consider widening its use of P3s for the renewal or expansion of its existing and future transit services, or the redevelopment of the properties and other assets that it owns.** P3s are coming into increasing use in U.S. transportation projects because of their capacity to accelerate project delivery, improve risk management by transferring appropriate risks to the private sector, enable the use of innovative technology and approaches, and ensure long-term service quality and availability. P3s may be particularly useful for the implementation of new types of service, as was the case with Canada's Ontario Line.
- **Review its full inventory of property and operations to assess the feasibility of employing P3s.** Transit agencies typically own substantial amounts of property in the form of stations, storage yards, right of way alignments, buildings, and parking facilities, including air rights, that may have potential as P3s. In some cases, transit P3s can generate new revenue through development, redevelopment, and value capture approaches using these assets, or even the use of naming rights, as was the case with San Francisco's Salesforce Transit Center. Working with a master developer for station projects may help MBTA take full advantage of its assets, as was the case with Denver's Union Station project and Washington Metro's Grosvenor-Strathmore Station.
- **Extend and supplement its existing expertise to ensure that any P3 procurement is appropriate for the projects under consideration and to support the agency for a successful procurement.** Transit agencies embarking on new or expanded P3 programs typically build their institutional capacity with a combination of new personnel, training and education of current personnel, and contracting with outside technical, financial and legal advisors. Substantial training and education resources are available through the U.S. Department of Transportation's Federal Transit Administration, Federal Highway Administration, and Build America Bureau to support agencies in their endeavors.

- **Use P3 procurement to provide strong incentives to competing proposers to develop innovative, cost effective approaches to meeting agency requirements using the best available technology, construction, operations and maintenance practices, and financial resources.** A competitive P3 procurement can help agencies obtain the best value for money. The winning concessionaire team should have strong financial incentives to deliver the project on-time and on-budget and to operate and maintain the project in strict accordance with the transit agency's performance requirements.
- **Recognize that to take full advantage of a P3, it may need to focus its attention on performance standards and relinquish reliance on design standards for a project.** P3s often add value for money by doing things differently than they have been done before. Such differences may entail new technologies, new procedures, new construction techniques and materials, and new operating practices.
- **Understand that realizing the benefits of a P3 will require early agreement on the project's scope.** Because the P3 is embedded in a binding contract, a change of mind midstream by the MBTA could lead to substantial cost increases and delays. Thus, investing the time and effort up front in the development of a project's scope and objectives is of paramount importance.
- **Acknowledge that any public transit P3 will require a long-term financial commitment from the agency to support availability payments to the concessionaire.** P3s do not provide "free money" for public transit. Transit agencies must have the financial capacity to support the P3.
 - **Availability payments are typically treated as debt by rating agencies and government accounting standards.** As such, these payments may require coordination with and approval from state financial authorities.
 - **The Federal Government offers substantial credit support programs for public transit P3 projects in the form of loans from its Transportation Infrastructure Finance and Innovation Act (TIFIA) and Railroad Rehabilitation and Improvement Finance (RRIF) programs.** The MBTA has already utilized TIFIA and RRIF for its Positive Train Control project and should continue to take maximal advantage of these resources.
 - **Financial crises do not necessarily have to derail P3s.** Many projects were delivered during the global financial crisis of 2008/2009. The financial crisis severely disrupted global financial markets. Yet, many P3s, such as the Denver Eagle P3 commuter rail project, were able to continue to financial close in spite of these disruptions.
- **Ensure appropriate protection for the agency in the P3 agreement in case the project(s) encounters difficulties throughout the development life cycle for risks that have been transferred to the concessionaire.** Risks that are often transferred to the private sector concessionaire through a P3 include design risk, construction risk, financial risk, and operation and maintenance risk.
 - **P3s do not transfer all risks to the private sector.** While P3s allow the transfer of many risks to the private sector, and the sharing of some risks with the private sector, the transit agency almost always retains significant risks. Key risks that

are typically retained by the transit agency include obtaining environmental approvals such as the National Environmental Policy Act (NEPA) Records of Decision (RODs), as was the case in the Maryland Purple Line project, timely acquisition of right of way (ROW), and changes in law or regulation that affect the cost of project delivery, as was the case in the Denver EAGLE P3 project.

- **Great care should be used in figuring out which risks can be borne cost effectively by the private sector, which are more suitable to be retained by the agency, and which can effectively be shared.** A successful procurement will generally require extensive discussions with the private sector on these risk allocation issues.
- **Engage actively in outreach and communications for any P3 project it pursues, both inside the transit agency and with its outside constituencies and stakeholders.** Such outreach and communications should include emphasis on how the process works as well as its strengths and its limitations. Because the P3 approach is relatively new in the U.S. market, elected officials, community and business leaders, the press and stakeholder groups, as well as internal stakeholders across the transit agency may not be familiar with the concept. An active outreach and communications process can heighten understanding and allay unwarranted concerns.

APPENDIX A: FUNDING & FINANCING OPTIONS

A. FEDERAL PROGRAMS FOR P3 FUNDING & FINANCING

I. FEDERAL GRANT PROGRAMS

The federal government provides both funding and financing to support transit public-private partnership (P3) projects. The funding programs are primarily grant programs that provide direct grants to transit projects that meet the criteria. Under most federal transit grant programs, P3 projects are treated the same as transit projects being developed through traditional procurement. From time to time, however, the federal government has created programs that specifically favor P3s. One example is the Penta-P program available in 2007, which provided a \$1 billion grant to the development of the Eagle P3 project in Denver. The Penta-P program provided grant funding specifically aimed at encouraging transit districts to pursue a P3 model for their projects. Houston Metro's Light Rail and San Francisco's Bay Area Rapid Transit's (BART's) Oakland Connector P3 projects also received funding through Penta-P.³⁸ The Penta-P program is no longer available.

Such federal grant programs may become available in the future. The Biden administration's infrastructure policy, when enacted, may include P3s as one element. A complete discussion of federal grant opportunities for P3s that are currently available and under consideration is beyond the scope of this report.

2. FEDERAL LOAN & CREDIT SUPPORT PROGRAMS

The two major federal credit support programs for transit P3s are the Transportation Infrastructure Finance and Innovation Act (TIFIA) and the Railroad Rehabilitation and Improvement Finance (RRIF), both of which the Massachusetts Bay Transportation Authority (MBTA) has already used. Its \$517 million Positive Train Control project has a TIFIA loan of \$162 million and a RRIF loan of \$220 million.³⁹

A) TIFIA⁴⁰

The TIFIA program was authorized in 1998 and most recently reauthorized in 2015 by Congress in the FAST Act (Fixing America's Surface Transportation Act, P.L. 114-94). TIFIA stands for the Transportation Infrastructure Finance and Innovation Act in which it was originally authorized. TIFIA provides credit support (but not grants) in the form of direct loans, loan guarantees, and standby lines of credit to projects of regional and national significance. TIFIA can lend funds up to 33% of total project cost (and with "compelling justification" up to 49%). The term of the loan can be up to 35 years after substantial completion of the project. The interest rate on TIFIA loans is the federal interest rate, which was 1.45% on May 26, 2020.

38. Regional Transportation District, "Eagle P3 Project Procurement Lessons Learned."

39. U.S. Department of Transportation, Build America Bureau, "MBTA Positive Train Control."

40. This discussion draws primarily from U.S. Department of Transportation, Build America Bureau, "TIFIA Credit Program Overview."

A further attractive feature of the TIFIA program is that it is subordinated to other loans against a project. What that means is that a P3 project can start repaying other project loans and defer paying TIFIA for up to 5 years after a project begins to generate revenue. The interest on the loan accrues until the start of repayment. This provision can lower the overall cost of capital for a project substantially, since the federal interest rate is typically the lowest available in the credit markets. This subordination goes away if a project runs into problems and fails to pay its debt service on time or otherwise defaults on its agreement, in which case TIFIA has equal status with other lenders to the project.

With these features—low interest rate and subordination—TIFIA financing is extremely attractive as a source of project finance. However, qualifying for a TIFIA loan requires substantial time and effort on the part of the project sponsor.

TIFIA requires the credit quality of the project to be strong enough to earn an investment grade rating from two bond rating services such as Moody's, Standard and Poor's or Fitch Ratings. Rating agencies scrutinize a project carefully in order to provide objective and comprehensive evaluations of a project for investors. This scrutiny will include the strength of the participants in the P3 company (the design builder, the operations and maintenance company, any rolling stock provider, etc.). It will also evaluate the sources of project revenues. Will the project be funded by sales tax revenues? How strong is the local economy's ability to generate sufficient revenue? How strong are the finances of the transit authority? What is its credit history? Are project revenues guaranteed by a city or state government, and if so, how strong are the finances of that city or state?

TIFIA also requires projects to meet a wide range of federal statutory requirements, such as compliance with the National Environmental Policy Act (NEPA) and Davis Bacon. If project sponsors anticipate applying to TIFIA, it is essential to consult with the TIFIA office at the U.S. Department of Transportation (USDOT) early on to ensure timely and most favorable possible consideration.

B) RRIF ⁴¹

The Federal Railroad Rehabilitation and Improvement Financing (RRIF) program provides loans and loan guarantees to finance the development of railroad projects. RRIF can finance up to 80% of eligible project costs. Like TIFIA, RRIF loans can be repaid over a period of 35 years and can be subordinated to other debt. Unlike TIFIA, however, Congress requires RRIF loans to carry a credit risk premium, which is intended to offset the risk of a default on their loan.⁴² The one-time premium is held by the U.S. government as a reserve to cover losses on any defaulted RRIF loans.

B. PRIVATE FINANCING

One of the most distinctive features of transit P3s is the access they provide to private financing. Like TIFIA and RRIF, government grants and credit support are based on the power of the

41. This discussion draws primarily from the following websites: U.S. Department of Transportation, Build America Bureau, "Railroad Rehabilitation & Improvement Financing (RRIF)"; U.S. Department of Transportation, Build America Bureau, "Transit."

42. Peterman, "The Railroad Rehabilitation and Improvement Financing (RRIF) Program," i.

government to tax. Private financing, on the other hand, is based on voluntary investments from individuals, pension funds, insurance companies, and infrastructure investment funds.

Transit projects and transit authorities compete in the global capital markets seeking to attract investment from these private investors. Success requires the transit investment to provide returns that are competitive with other options in the market.

Moreover, the market is highly dynamic, varying considerably throughout the day, week, month, and year. The Global Financial Crisis of 2008/09 had a large impact on the market for private transit investment, and the COVID-19 pandemic of 2020 is prompting considerable change in financial markets as well. Successfully attracting private investment requires the agility to present an attractive investment opportunity that helps the transit agency achieve its objectives.

Private finance is a complex field unto itself and well beyond the scope of a report such as this. But it is important for transit analysts, planners and managers to understand a few basics. First, what are the major types of investments? Second, what are the major categories of investors?

I. TYPES OF INVESTMENTS

As mentioned above, there are two major types of transit financing: loans and equity. A loan is an exchange of a specific amount of money with a promise to repay it with interest. A loan in and of itself does not typically confer ownership. The mortgage on a home, for example, does not confer ownership on the bank lender. Rather, the borrower remains the owner of the home as long as s/he makes the promised payments on time. Only if the borrower defaults by missing a payment does the bank then have the right to foreclose on the home and take ownership. Importantly, the value of the loan does not typically float with the value of the collateralized asset. The mortgage bank does not get a share of any increase in the value of a home when it sells. Neither does the sale of a house at a reduced price reduce the amount due on the loan. The equity owner bears all of that risk.

Equity investment, on the other hand, confers ownership. And the value of that equity stake depends on the value of the property that has been purchased. If the value rises, that increase redounds to the owner's stake. Likewise, if the value falls, so too does the value of the owner's stake. Ownership also confers the right to any cashflow the asset generates, and a responsibility to pay the operations and maintenance costs of the asset.

In this way, lenders take a risk that the borrower will not be able to service the debt as promised. The loan agreement outlines recourse in case the borrower fails to do so. Equity investors take the risk that the underlying asset will not generate the returns expected at the time of the deal.

There are several different types of debt instruments. Two main categories are relevant here: bank loans and bonds (see the key features of each in the adjacent table).

TABLE A-1: Key Features of Bank Loans & Bonds

KEY FEATURES	
LOANS	<ul style="list-style-type: none">• Duration: Typically 10 years or less• May be resold, but not typically through securities markets• Repayment provisions: Laid out in the loan instrument• More easily renegotiated if problems arise since the number of parties involved is lower.
BONDS	<ul style="list-style-type: none">• Duration: Up to 30 years• Typically sold in security markets regulated by the U.S. Securities & Exchange Commission (SEC)• Repayment provisions: Typically rigid requirements for when payments of principal & interest are due.• Difficult to renegotiate since the number of owners may be in the hundreds or thousands.

Another key distinction among debt instruments is whether the interest they generate is taxable to the lender. Compared to global markets, the U.S. market is unusual in that the interest paid by states and localities are not subject to the federal income tax. As a result, those who buy municipal debt (i.e., debt issued by states and localities) are willing to accept a lower rate of interest than they would for lending to an entity whose interest was subject to federal tax. For example, on June 1, 2020, a highly rated (AAA) municipal bond with a term of 30 years was paying 1.68% interest, whereas a comparable corporate 30-year bond was paying 2.94% interest, a difference of 1.62% (or 162 basis points in the language of the market).⁴³ For a bond of \$50 million, for example, the savings in annual interest comes to \$810,000/year, a substantial amount for most municipal issuers.

Transit P3s are typically allowed to borrow at this municipal rate, even though they are private companies. Such private activity bonds.^{44,45}

The U.S. Department of Transportation’s Build America Bureau determines whether a particular project qualifies as a PAB and hence, is eligible for the tax-exempt status. Typically, a transit project would qualify. As of April 7, 2020, a total of \$14.4 billion in PABs had been issued or were in the pipeline. For example, Maryland’s Purple Line project financing used \$313 million in PABs, the Denver Eagle P3 used \$398 million in PABs, and the Brightline (Virgin Trains) passenger rail project in Florida used \$2.7 billion in PABs.⁴⁶

2. CATEGORIES OF INVESTORS

In the U.S. market, private equity investment in transportation infrastructure is dominated by infrastructure investment funds. In recent years, pension funds have begun to invest in transportation, either through investment funds or in a few cases, by directly investing in specific projects. An infrastructure investment fund is a pool of investment capital assembled by an

43. Raymond James and Associates, “Weekly Interest Rate Monitor.”

44. & 45. Lovell, “Denver’s Landmark Eagle P3 Project.”

46. U.S. Department of Transportation, Build America Bureau, “Private Activity Bonds.”

investment bank or firm such as Macquarie, Blackrock or the Carlyle Group. In the five years ending in 2019, infrastructure investment funds raised \$496 billion dollars globally, of which \$239 billion was focused on the North American market.⁴⁷

U.S. pension funds have begun to invest more actively in infrastructure. CalPERS is the California public employee pension fund and is the largest pension fund in the U.S. It allocates 1.3% of its \$370 billion portfolio, or \$4.8 billion, to infrastructure. One of its holdings is a share of the Indiana Toll Road Concession Company, for example. Most pension funds invest through investment funds, since the pension fund staff do not have sufficient expertise to select and monitor investments in individual projects. A few pension funds, including CalPERS, have begun to develop in-house staff to invest in individual projects directly. Because pension funds are tax exempt, they do not typically invest in PABs or municipal bonds, whose tax-free status would provide no benefit to the pension fund.⁴⁸

C. VALUE CAPTURE & JOINT DEVELOPMENT

A third source of potential funding is value capture. Value capture for transit has begun to see wider use in the U.S. market. The basic idea is that some of the increase in land value that a transit station or service confers to adjacent property is used to pay for the development of the transit. Here, the “public” part of the P3 might be the transit investment, with the “private” part being the development of the adjacent land that is made more accessible by the presence of the transit facility or service.

An example of large-scale value capture and joint development is the Union Station project in Washington, D.C. In this project, the Union Station Development Authority (a non-profit that has a long-term lease on the historic station) is working with a private developer to redevelop the air rights above the station’s tracks. The project, slated at some \$14 billion in total, will result in new platforms and access ways for trains serving the station as well as mixed-use development above the tracks, including retail, residential and office space.

Some of the most noteworthy value capture station projects have occurred outside the U.S. Japan has used value capture to help fund the development of several of its stations, including Tokyo’s central station. Transit in Japan is an entirely different system than U.S. transit, but the basic concept of value capture translates well. The Kuala Lumpur (KL) Sentral Station in Malaysia is another example. In KL Sentral, the government granted ownership of a former rail yard of 170 acres in exchange for a commitment from the P3 company to build an intermodal station to service four different transit services using eight platforms.

Tax-increment financing (TIF) is another tool for value capture. In a TIF, property tax revenue from the property in an area that will see increased land value as a result of the transit investment in its neighboring transit station or line is earmarked to provide funding for the transit improvement. A TIF would typically remain in place for a considerable period, say 10 to 20 years. The Federal Transit Administration website contains a number of resources for further exploration of value capture, and the World Bank also has resources on how value capture is used in developing countries.⁴⁹

47. Poole, “Annual Privatization Report 2020,” 3, 6.

48. Poole, 21.

49. U.S. Federal Transit Administration, “Value Capture”; Suzuki et al., Financing Transit-Oriented Development with Land Values.

APPENDIX B: PROJECT EVALUATION TECHNIQUES

A. VALUE FOR MONEY ANALYSIS

Value for Money (VfM) analysis is the most common metric used to gauge the desirability of using a public-private partnership (P3) for project delivery. The crux of the method is to estimate two cost scenarios: the cost of conventional delivery and the cost of using a P3. If the cost estimate of the P3 is lower than the cost estimate for conventional delivery, then there is a reasonable case for looking more closely at the P3 option. Note that the VfM analysis is not the last word. It is possible a P3 option with a low or negative VfM could make sense, just as it is possible that a P3 option with positive VfM may not make sense for the agency. But the VfM provides one metric that is generally viewed as important in evaluating the P3, and is a required element for some funding sources such as Transportation Infrastructure Finance and Innovation Act (TIFIA).

I. QUALITATIVE VALUE FOR MONEY

Before embarking on the estimation of VfM, a qualitative assessment is in order. “The purpose of the qualitative analysis is to identify the expected differences between a P3 solution and the conventional approach, to prepare for the monetization of these differences in the quantitative analysis. Typically, the differences are linked to costs, revenues, and risks.” While the quantitative VfM focuses on cash flows and risks, the qualitative VfM includes a focus on non-quantitative elements, such as differences in the quality of the facility or service being procured, the organizational impact of changing delivery methods, and the loss of flexibility inherent in specifying a project in a long-term contract. The qualitative assessment should also address public perceptions of P3s and the transit agency’s capacity to communicate effectively with relevant stakeholders, such as the contracting community, media, community leaders, and the general public.^{50,51}

2. QUANTITATIVE VALUE FOR MONEY

The nearby figure illustrates the concepts of the quantitative VfM analysis. The left bar on the chart shows the expected cost of using conventional delivery for the project, that is, the cost to the owner (the transit agency) of undertaking a project using its traditional procurement approach. This is often called the public sector comparator (PSC). The right bar represents the estimate for using a P3, which is often called the shadow bid. The overall height of the bars represents the magnitude of the cost. In this illustration, the cost of the P3 is lower than conventional delivery.

The total cost of the PSC is made up of five types of costs: base costs, financing costs, risks, ancillary costs, and a fifth type labeled “competitive neutrality.”

Base costs are the transit agency’s best estimate of the costs of delivering the project, including design, construction, rolling stock, and operations and maintenance for the life of the project. For a typical transit investment, the time horizon would likely be 30 to 50 years. To account for the

50. & 51. U.S. Department of Transportation, Federal Highway Administration, “Guidebook for Value for Money Assessment,” 19.

the fact that these costs would be incurred far into the future, they are represented here as present values.⁵²

Financing costs refer to the cost of obtaining the funds required to construct the project. For a large capital project with long-term operations and maintenance funded from annual appropriations, financing costs would be virtually zero. If the transit agency issued municipal bonds, the financing costs would reflect the costs of issuing the bonds (that is, transaction costs) plus the interest on those bonds to be paid to bondholders in the future, again, all represented as present values.

Risks are an estimate of the costs of handling problems that could arise. In a construction project, this estimate might be based on the agency's history of cost overruns on similar projects. The risk estimate is similar to a contingency estimate that measures how much is needed to be set aside in case things go badly.

This risk estimate is often overlooked or discounted in public delivery projects. Project advocates may have "optimism bias" and wish to present the project in its most favorable light. The treatment of risk, as mentioned earlier, is an important differentiator between P3s and conventional delivery.

Ancillary costs refer to transaction and oversight costs, that is, how much the agency has to budget for procurement and oversight. As shown, it is a relatively small fraction of the cost.

Competitive neutrality is an estimate of how much the transit agency gains in comparison with the private sector because of its status as a public entity. For example, public agencies can often issue tax-free bonds, which may not be available to the private sector. That reduced cost of capital would be part of the competitive neutrality calculation. Governments do not typically pay taxes, which gives them a cost advantage over the private sector. The idea behind including competitive neutrality in the cost of conventional delivery is to create an even playing field when comparing it with private delivery.

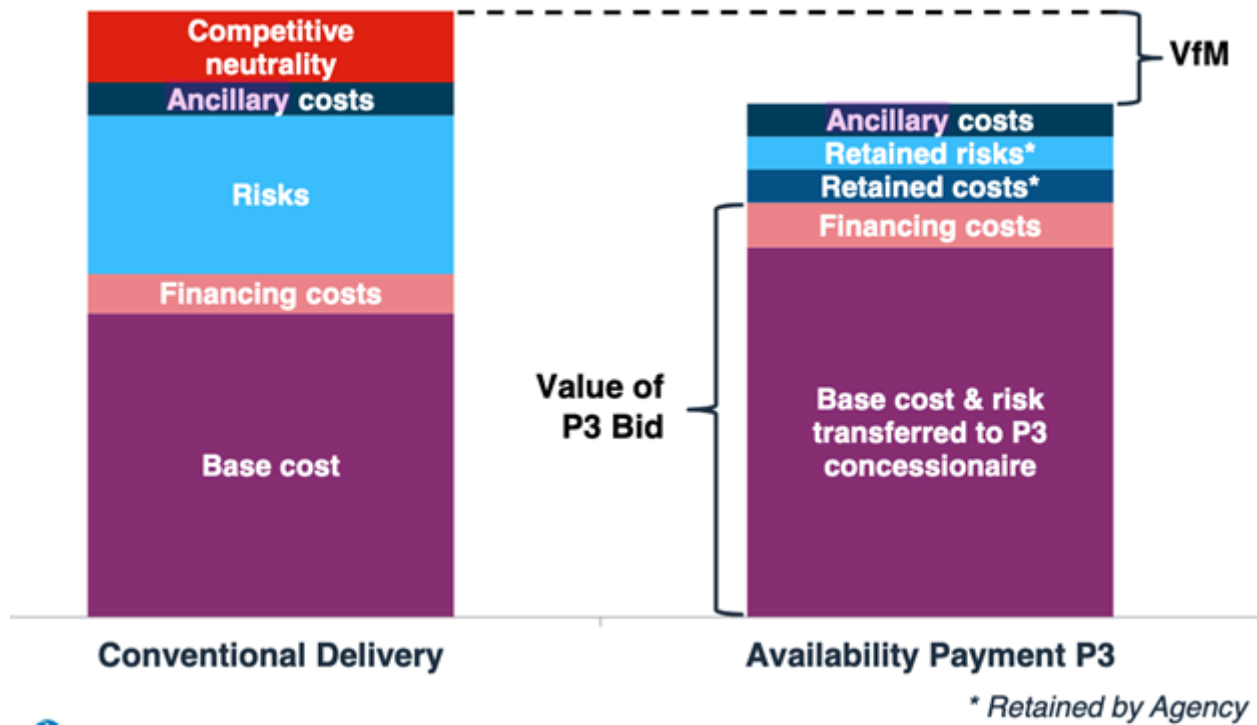
The right-hand bar, representing the cost of an availability payment P3, shows a base cost plus transferred risk to the P3. This cost is shown in the example to be larger than the conventional delivery base cost, which stands to reason since the P3 is accepting some of the risk borne by the owner under conventional delivery. Financing costs are shown to be slightly larger, reflecting the usual case where the cost of financing for a P3 exceeds that of the government. Ancillary costs are shown to be about the same. Two costs are retained by the owner: retained risk and retained costs. These are costs that cannot be transferred efficiently to the P3, such as force majeure and environmental permitting.

The VfM shown in the figure indicates that there is "value for money," that is, the P3 has a lower estimated total cost than the conventional delivery.

52. For a discussion of present value and net present values in project assessment, see a general public policy text such as Weimer and Vining, *Policy Analysis*.

FIGURE B-1: Breakdown of Quantitative Value for Money Analysis

Quantitative Value for Money Analysis



SOURCE: U.S. Department of Transportation, Federal Highway Administration. “Public-Private Partnership Value for Money Assessment Using P3-VALUE 2.1.” March 22, 2018. https://www.fhwa.dot.gov/ipd/pdfs/p3/webinar_p3_vfm_p3_value_2_1_vfm_0318.pdf

B. FINANCIAL VIABILITY ASSESSMENT

Just because a project has value for money does not mean the transit agency can afford it. That is the role of financial viability assessment. An availability payment P3, for example, requires the government to enter into a long-term commitment to pay the availability payment, and perhaps also milestone payments during construction. Does the transit agency have the revenues to do that? That will depend on the agency and its ability to access tax revenues and the health of its farebox revenues.

Some transit agencies have access to municipal bond markets and can raise capital for a project, which requires a flow of payments to repay bondholders. Some agencies have access to dedicated tax revenue, such as sales tax revenue. There is uncertainty associated with these revenue sources to be sure. But the purpose of the financial viability analysis is to ascertain whether the transit agency is able and willing to commit the resources to the project that are required.⁵³

53. U.S. Department of Transportation, Federal Highway Administration, “Financial Structuring and Assessment for Public-Private Partnerships: A Primer,” 5–7.

C. ECONOMIC ASSESSMENT: BENEFIT-COST ANALYSIS

A third type of assessment for a project is whether it is socially beneficial, that is, whether its benefits outweigh its costs. A project with value for money that is financially viable may still not make sense economically. Assessing benefits and costs looks to the future and tries to estimate the value of the project to its users and other beneficiaries.

Benefit cost analysis is broader than financial viability assessment because it looks not just at the financial cashflows of a project, but also at how the project would affect society more broadly. Does a project improve safety? Does it fulfill a goal to provide mobility to disadvantaged communities or enhance walkability? Does it help the environment by, for example, improving air quality by attracting travelers who might otherwise drive polluting cars? Public transit projects are very often supported by governments for exactly such reasons.

Benefit-cost analysis also looks at the negative societal impacts of a project. Will the project increase noise levels? Does its construction disrupt communities, particularly disadvantaged communities? Benefit-cost analysis attempts to account for all of these effects, convert them to dollar amounts in present value, and then compare them. A project with positive net benefits, that is, whose benefits exceed its costs, is expected to make society better off. A related metric, the benefit-cost ratio, is also often used in project assessment. A project with a benefit cost ratio greater than one is socially beneficial. However, the benefit-cost ratio is slippery and should be used with great caution.

APPENDIX C: EXPLORING & ESTABLISHING A P3 PROGRAM

A transit agency that wishes to embark on an exploration of using public-private partnerships (P3s) for the delivery of some of its facilities or services needs to take a careful and comprehensive approach. The Federal Transit Administration (FTA) and the Federal Highway Administration (FHA) have jointly produced a guidebook for public owners such as transit agencies, which this section summarizes. The process laid out there consists of four stages or steps (illustrated in the nearby figure):

1. The pre-procurement phase, during which the agency may issue a request for information (RFI) or utilize other forms of “market sounding”;
2. Starting the procurement, during which a request for qualifications (RFQ) is used to identify a shortlist of firms to be invited to submit proposals;
3. Continuing the procurement, including the issuance of a request for proposals (RFP) and the selection of a preferred bidder; and
4. Finalizing the procurement with the selection of a preferred bidder and reaching commercial close.⁵⁴

FIGURE C-1: Phases of the P3 Process



SOURCE: Smith, Nancy, Patricia de la Peña, Edward Kussy, Sonika Sethi, Porter Wheeler, Jonathan Gifford, and Shirley Ybarra. “Public-Private Partnership (P3) Procurement: A Guide for Public Owners.” U.S. Department of Transportation, Federal Highway Administration, March 2019, p. 7.

A. THE PRE-PROCUREMENT PHASE

The pre-procurement phase is critical for the success of a P3 program or individual P3 project. During this initial phase, the agency needs to ask whether it envisions a single project as a P3, an ongoing program, or “pipeline” of P3s. Making this assessment requires a review of the full range of the agency’s activities and services to see which may be suitable for P3 procurement.

54. Smith et al., “Public-Private Partnership (P3) Procurement.”

Sometimes the impetus for consideration of P3s is a single project. Indeed, as noted earlier, sometimes the P3 is a last resort: “We don’t have enough money for this project, so let’s do a P3.” Relying on this rationale alone will likely lead to problems. Critical activities in the pre-procurement phase are structuring the procurement team and developing the project delivery strategy. It is also important to consider strategies for acquiring environmental and regulatory approvals and conducting due diligence on the project.

I. STRUCTURING THE PROCUREMENT TEAM

A P3 procurement, especially an agency’s first, is a major organizational undertaking. It requires support from agency leadership, as well as adequate staffing and budget, and access to technical, legal and financial expertise, either from within the agency or through external advisors. Depending on the agency’s legal authorities, it may require approvals or oversight by a separate agency or governing or legislative body. The procurement team must also coordinate with state, regional, and local bodies, as well as relevant federal agencies.

While support from agency leadership is essential, the procurement team should have sufficient decision-making authority to manage the day-to-day requirements of the procurement. Important decisions may need to be made quickly as the procurement proceeds, and the agency should establish efficient approval processes to allow for timely decisions that support productive workflows. P3s, by their nature, often aim to utilize greater flexibility and innovation than traditional procurement. Taking full advantage of the potential of P3s, while protecting the agency, may require timely access to leadership as the procurement proceeds.

The project manager’s responsibilities include managing schedule and cost, overseeing, training, and collaborating with staff and consultants, and engaging agency leadership. The project manager must also coordinate with industry and the potential proposer community, as well as reach out to the public. Staffing for the procurement team will typically require a combination of in-house staff and external consultants to supplement and extend it. Technical expertise is required to evaluate and conduct due diligence for all phases of the project’s design, construction, and operations and maintenance. P3s often involve proposals for alternative technical concepts (ATCs) that the procurement team must evaluate with respect to schedule, cost, and effectiveness, as well as environmental and community impact.

Legal expertise is also critical. P3s typically involve the development of procurement and contract documents, and support from the legal team for due diligence on legal matters, administrative and legal requirements for proposers, evaluations on proposal compliance, and general legal counsel. The legal team will typically include the agency’s general counsel, the Attorney General’s office in some cases, and external specialized counsel.

Financial expertise is required to evaluate the often complex financial structures and assessments that P3s require, such as analyses of Value for Money (VfM), benefit-cost, and financial viability, as well as interacting with federal credit support programs when used. Financial expertise is typically provided through agency financial staff as well as an outside expert P3 advisor.

In addition, the P3 team will require staff and expertise for outreach and communications to the public, as well as specialists as needed for insurance and performance security, right of way acquisition, traffic and revenue forecasting, and other areas.

2. PROJECT DELIVERY STRATEGY

Not every project is suitable for P3 delivery. An agency contemplating delivery using a P3 needs to first ascertain whether the project is well-suited for it. Key features of successful P3s include:

- Strong political support;
- Potential for economies of scale and innovative methods of design, construction, operation, and/or maintenance;
- Suitability for performance requirements instead of regulated methods of delivery;
- Eligibility for federal credit support programs such as Transportation Infrastructure Finance and Innovation Act (TIFIA), Railroad Rehabilitation and Improvement Financing (RRIF), or private activity bonds (PABs); and
- Agency access to revenues and financial resources to support long-term availability payments.

The procurement team evaluates the candidate project(s) using VfM, benefit-cost, and financial viability analysis, as discussed in section VIII and Appendix B. If the project appears to be suitable using these metrics, the team would proceed to develop the project scope and term of concession.

Agencies may wish to “sound out” the market by engaging the private sector in these discussions. Such market sounding exercises not only help the procurement team understand the private sector’s appetite for various delivery approaches, but also alert the private sector to the possibility of a future proposal opportunity. Market sounding may be done informally through meetings (taking care to provide the same information to all parties) or through a more formal request for information (RFI).

At this phase, the procurement team also assesses how required environmental review and regulatory approvals will affect the project. These include the National Environmental Policy Act (NEPA), the Clean Air Act and amendments, the U.S. Department of Transportation (USDOT) transportation planning processes, and relevant state and local planning and approval processes.

The procurement team also exercises “due diligence” to ensure that it considers all materials and information relevant to entering into the P3 process. Considerations include ridership projections, regulatory approvals, consultation with utility owners and other third parties, public outreach, right of way strategy, and the potential for federal participation.

Some agencies have used pre-development agreements (PDAs) or comprehensive development agreements (CDAs), which entail involving a contractor at the pre-procurement stage. Also, “progressive P3s” have been used in cases where the pre-procurement activities entail

significant time, effort, and investment by the transit agency. Engaging a private sector partner at the early stage of a procurement sacrifices some of the price competition for the total project, but may lead to savings later on if the agency is required to modify the scope in the course of development due to planning, regulatory, political, or other considerations.⁵⁵

B. STARTING THE PROCUREMENT

Once the project has been defined, the agency can begin its procurement. P3s typically utilize “best value” procurement, which entails a two-step process and is used by some agencies in their traditional procurements. First, the agency issues a RFQ, evaluates the statements of qualifications (SOQs), and selects a “shortlist” of teams to submit technical and financial proposals. Second, the agency issues a request for proposals (RFP), which will be discussed in the next section.

While traditional procurement also uses RFQs and RFPs, P3 procurements focus on identifying innovative ideas and the capacity to deliver them to the transit agency. A P3’s procurement documents typically grant potential proposal teams much greater freedom to develop innovative solutions to the agency’s requirements.

The composition of the teams will depend on the nature of the particular project. Typical participants for transit projects could include a design-build firm or firms, an operations and maintenance firm or firms, a vehicle supplier (for train sets, light rail cars, or buses), control and signaling equipment suppliers, fare collection equipment suppliers, lenders (subject to expectations about federal loans or PAB allocations), and equity investors. The assembly of these teams is a significant undertaking for the bidders. Transit agencies may wish to allow firms to participate on multiple teams.

The development of the RFQ builds on the project definition of the previous stage and adds a structure and procedure for evaluating SOQs. In order to attract healthy industry interest, the agency will need to provide sufficient information to potential teams to allow them to evaluate the nature of the opportunity, SOQ assessment metrics, and how a particular team may best present itself to make the shortlist. The agency may wish to have “one-on-one” meetings with potential bidders to hear how they might approach the project and ensure that the RFQ includes criteria that capture the most relevant qualifications.

Key considerations for the RFQ are selecting teams that meet the agency’s goals, which typically include reducing the agency’s costs, delivering high quality facilities and services, and accelerating the delivery of the project. The agency will also want to ensure full, fair, and open competition. The FTA has produced a manual of best practices to help guide projects that will seek its approval.⁵⁶ Agencies also need to exercise great care in managing conflicts of interest to ensure that they do not undermine subsequent decisions. For example, an unknown family member or personal connection between someone on the procurement team and one of the bidders can cause enormous problems later in the procurement.

55. Hewes and Randolph, “Public-Private Partnerships in California,” 38–39.

56. U.S. Federal Transit Administration, “Best Practices Procurement and Lessons Learned Manual.”

The number of firms on the shortlist is not fixed, but typically ranges from three to four. A shortlist of more than that may lead firms to decide not to submit a full proposal because their likelihood of winning is too small. A shortlist of fewer than that puts the agency at risk of not having vigorous competition on price and technical approach, especially if one of the invited teams drops out or fails to submit a fully compliant proposal.

From the perspective of the teams on the shortlist, the decision to proceed with a full-blown proposal is a major business decision, often requiring approval of the boards of directors of the participating companies. For projects at the billion-dollar level, firms typically invest millions of dollars to develop their proposals. The firms also face an “opportunity cost,” that is, they can only commit their resources to a limited number of proposals. Depending on market conditions, the agency must take into account how to make its project stand out as desirable enough for the firms to make that commitment.

Most firms are used to tough competition. That is the nature of their businesses. In evaluating whether to commit the resources to join a team and submit a proposal, firms seek a degree of certainty that the proposal will reach the award stage without cancellations due to political or budgetary considerations, especially after heavy investment in proposal development.

C. THE PRE-SELECTION PERIOD

Once an agency has developed a shortlist of proposal teams, the next step is to develop and issue the RFP. RFP development typically entails significant input from the proposal teams. The agency may issue a draft RFP, and then meet one-on-one with proposal teams to identify any modifications that will allow a particular team to put forward its best ideas for delivering the project. The final RFP will contain the agency’s procurement and contract terms and set the schedule for proposal submission.

The RFP will also contain the evaluation criteria for selecting the winning proposal. Such criteria typically would include the qualifications of firms and the proposed personnel, as well as cost. Evaluation criteria and proposal scoring approaches can take a wide variety of forms and may be affected by the transit agency’s procurement policies as well as those of state or other governing jurisdictions.⁵⁷

The RFP will often require some form of proposal security in the form of a bid bond or letter of credit that commits the proposing team to proceed to financial close in accordance with the terms in its proposal. Failure to do so leads to the forfeit of the proposal security. Proposal security for Maryland’s Purple Line, for example, was \$10 million.⁵⁸

Once the agency issues the final RFP, it may need to revise it with addenda to address issues raised by proposers, to refine ideas or provide additional information. This may involve confidential one-on-one meetings with proposers, where teams may present details of their approach to the agency.

57. Smith et al., “Public-Private Partnership (P3) Procurement,” 53–54.

58. Smith et al., 82.

Teams may present or expand upon ATCs or alternative financial concepts (AFCs) that present novel and innovative approaches to addressing the technical and financial challenges of the project. These may involve alternative design approaches, construction techniques and materials, operating concepts, and financial arrangements. From the agency's perspective, these ATCs and AFCs can provide tremendous value for reducing costs and improving quality.

Again, the agency's objective is to receive fully compliant proposals from all teams on the shortlist and avoid having firms drop out at the proposal stage, which would narrow the agency's range of choice in making its selection and lessen the competitive pressure on the proposers to provide their best pricing and technical proposals. Once the agency receives its proposals, it evaluates them in accordance with the procedures set forth in the RFP, using whatever scoring and evaluation process it presented there. The agency may go back to proposers and request clarifications.

At this point, the agency may select a preferred bidder, request revisions, or cancel the procurement if no proposals are deemed to meet the requirements of the RFP. If it has selected a preferred bidder, the agency may proceed to award the contract directly or engage in negotiations. If the agency fails to reach agreement with its preferred bidder, the contract may go to its second choice, or cancel the procurement.

D. SELECTION TO COMMERCIAL & FINANCIAL CLOSE

The next steps in procurement after reaching agreement with a selected bidder are commercial and financial close. Commercial close entails the award and execution of the contract, and may be subject to various requirements depending on the transit agency's jurisdiction, including approval from a board of directors or other state or local officials.

From the proposer's side, the requirements for commercial and financial close will be set forth in the RFP and may require additional security. A number of issues must typically be addressed between commercial and financial close, including delivery of financing commitments from USDOT where TIFIA or RRIF loans are involved (common for transit P3s), or the issuance of PABs to support the project.

E. FROM FINANCIAL CLOSE FORWARD

Reaching financial close for the project marks the end of the procurement, but also marks the beginning of the partnership, which often has a term of many decades. No contract envisions every eventuality that may arise, from pandemics to financial crises to natural disasters.

For the agency, the relationship with the P3 may be quite different from those it is used to with its suppliers. The agency has a stake in the success of the project in delivering timely, efficient, and high-quality service to its users. For the P3, the challenge is delivering the project, overcoming inevitable obstacles, serving its users, paying its debtors, and returning equity to its owners.

It is a partnership that will require flexibility on both sides. Some of the transit P3s in the U.S. have encountered substantial challenges in their early years, which is all that is known at this point since most are less than ten years old. The Eagle P3 commuter rail project in Denver encountered substantial challenges with receiving approval of its grade crossing system from the Federal Railroad Administration. At one point, the sponsor, Denver Regional Transportation District (RTD), threatened to terminate the contract for the P3's failure to deliver that approval. The P3 eventually received its approval and RTD withdrew the termination threat. But the noncompliance penalties that RTD imposed on the P3 are still under dispute.

The Purple Line has encountered serious delays due to an unexpected court order delaying the start of construction and unexpected design requirements from an adjacent railroad in one segment. The P3 has threatened to withdraw. The P3 and the state are in negotiation about how to resolve the matter.

Such challenges may not be directly attributable to the use of P3s for procurement. But the P3 introduces new complexities to resolving the challenges that may be new to the sponsoring transit agency. Yet, the Eagle P3 is delivering a high-quality commuter connection from downtown Denver to the Denver International Airport, which meets one of RTD's principal objectives in the procurement. Delivering that service without the P3 could have presented substantial challenges to RTD's resources and capabilities.

While P3s do not overcome all challenges for an owner, they can deliver value for money when used for appropriate projects. Substantial resources for agencies exist in the USDOT P3 procurement guide and the FTA best practices manual, as well as multiple other resources. These resources provide much greater detail and guidance for agencies wishing to investigate the viability of the P3 approach.

F. INSTITUTIONAL ARRANGEMENTS

How do agencies organize their P3 efforts and how do they relate to existing offices and entities? Developing P3s requires a significant body of specialized skills and backgrounds. Moreover, the breadth of the P3 approach for designing, building, financing, and operating and maintaining facilities and services can cut across the responsibilities of a wide array of agency functions, including legal, finance, planning, human resources, contracting, capital projects, government, and public affairs. Agencies considering P3s may need to extend or supplement their existing expertise with consultants and advisors on a range of technical, financial, and legal issues.

Transit agencies considering P3s need to be thoughtful about where to place P3 responsibilities in their organizational structures. One approach is to create a dedicated P3 unit within the agency, as California's LA Metro has done, as discussed below. This is the approach that was found to be most common in 2010 by an international organization of developed countries, the Organization for Economic Cooperation and Development (OECD).⁵⁹

The decision about how to organize P3 activities is often subject to constraints imposed by state

59. Organization for Economic Co-operation and Development (OECD), Dedicated Public-Private Partnership Units.

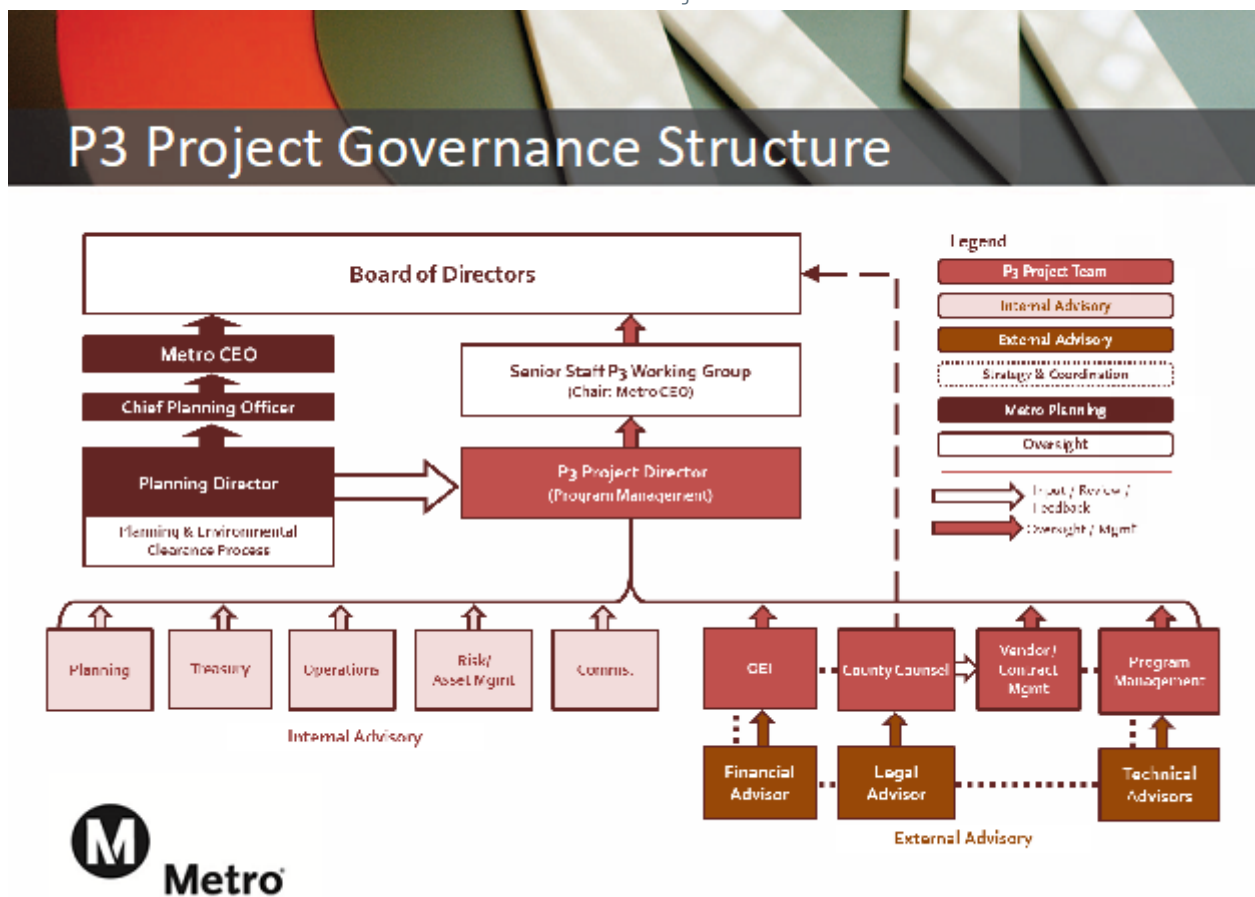
or local law. Some states have a dedicated P3 unit, which can provide technical support and advice for the transit agency. In other cases, the transit agency may need to develop its own resources and expertise.

I. P3 OFFICE

Los Angeles Metro launched an ambitious P3 initiative in 2015.⁶⁰ The CEO, Phil Washington, came to LA Metro from Denver RTD (Regional Transportation District), where he had been instrumental in the development of the Eagle P3 commuter rail service from downtown Denver Union Station to Denver International Airport. (See section III.A.2 for a case study of the Eagle P3).

LA Metro is a county entity with responsibility for planning, policy, funding, and delivery of transit service to the City of Los Angeles. Responsibility for P3s in LA Metro is illustrated on the nearby chart. The “P3 Project Team” consists of a P3 Project Director, the Office of Extraordinary Innovation, the County Counsel, and the office of Program Management. The P3 Project Team is supported by internal advisors from various line departments (Planning, Treasury, etc.) and by externally contracted financial, legal, and technical advisors. A Senior Staff P3 Working Group, chaired by the CEO, oversees the P3 Project Team.

FIGURE C-2: Governance Structure of LA Metro P3 Projects



SOURCE: Joshua Schank, “Office of Extraordinary Innovation (OEI),” Presented at the Transportation Research Board 99th Annual Meeting, Public-Private Partnerships Subcommittee, ABE10(1), Washington, D.C., January 13, 2020.

60. Los Angeles County Metropolitan Transportation Authority, “L.A. Metro Announces First Chief Innovation Officer.”

2. OUTSIDE ADVISERS

As in the case of LA Metro, P3 offices generally utilize outside advisors who are retained on an on-call basis to supplement and extend their internal expertise and know-how. Three areas are particularly important: financial, legal, and technical. These advisors are on the transit agency's "side" in discussions with potential P3 teams for the duration of the P3 development, from pre-procurement through the final financial close on a contract.

Agencies typically retain such advisors in order to extend and supplement their in-house capacity and expertise to deal with the complex financial, legal, and technical issues that arise in a P3 development. Developing a legally "bulletproof" procurement strategy, for example, is quite different for a P3 project than it is for the types of procurement most transit agencies have experience doing. The legal features of a 1000-plus-page concession agreement are typically outside the experience for most transit agency counsel. Participation of agency counsel is imperative, however, not least to help identify and overcome statutory and regulatory barriers that may arise.

3. CAPACITY BUILDING

If the transit agency envisions a "pipeline" of P3 project over the course of many years or decades, the capacity of its in-house personnel can develop more expertise in P3 delivery. An explicit capacity building program to attract and retain new personnel with the required skill sets can be beneficial. Just as important to this can be the training of existing personnel with the needed skill sets. Such capacity building may require redefining job titles and position descriptions, which may be a time-consuming process within the confines of longstanding personnel systems.

An additional challenge is retaining personnel once they have acquired the needed skill sets. Career opportunities outside the transit agency often arise, sometimes with the very outside advisors retained by the transit agency. This "revolving door" can pose challenges to agencies that have not instituted recruiting and capacity building programs to fulfill the requirements of P3s.

4. COMMUNICATIONS & PUBLIC OUTREACH

Communications, both internal and external, is also an essential element of any P3 development initiative. On the internal side, P3s are a very different way of doing business. As mentioned, they cut across a wide swath of organizational activities, including HR, legal, contracting, finance, etc. It is important for an agency seeking to develop P3 capability to reach out to these other departments to help them understand the potential value of a P3, or at least enough of the value of a P3 to avoid active opposition.

P3s also do best when supported by a well-resourced external communications team because external stakeholders may not be familiar with the P3 process. It is generally useful to reach out early and often to lawmakers, community leaders, and the press to demystify P3s to the extent possible, and to prepare for a quick response in case of misinformation that could damage a project's prospects. Project opponents sometimes seek to use a project's P3 status as a point for rallying opposition, even when the procurement approach has nothing to do with their opposition.

Communications and outreach about a P3 project or the development of a P3 program may require coordination with the overall agency’s communication and outreach strategy. Having communications talent in the P3 team can be helpful if events require a prompt response to unfolding events or one-sided presentations in the media.

G. UNSOLICITED PROPOSALS

The processes outlined above envision a system whereby project ideas emerge from an agency’s long-term planning process, carried out in concert with its regional planning authorities. Some transit agencies, however, have the legal authority to consider unsolicited proposals. An unsolicited proposal is a new or innovative project idea from outside the agency’s normal planning process. For example, a private developer might see an opportunity to develop an agency’s asset into a mixed-use development using a P3 approach. The asset in question might be the air rights above a rail alignment, a rail switching or storage yard, or a suburban station parking facility.

Unsolicited proposals have advantages and disadvantages. On the pro side, unsolicited proposals can bring agencies opportunities that they themselves have not recognized. Developers are in the business of recognizing potential value and figuring out ways to realize that value. An unsolicited project realized as a P3 could help the transit agency’s bottom line by generating revenue or reducing costs. Or it might serve the public interest more broadly, by expanding housing.

On the other hand, the evaluation of unsolicited proposals can divert scarce agency staff and resources from other initiatives in its development pipeline. The advocates in support of and stakeholders in these other projects may raise questions about the fairness of prioritizing the unsolicited proposal.

Under an unsolicited proposal program, agencies may allow unsolicited proposals at any time, or during a specified window of time. Proposals are then evaluated by the agency at a high-level screening to determine if they are consistent with the agency’s mission. Those that pass this initial screening are then subjected to further agency review and public comment. If an agency chooses to pursue an unsolicited proposal, then it would generally proceed with an accelerated form of open procurement that would include a full proposal from the team that originated the unsolicited proposal. For example, LA Metro has instituted formal program for unsolicited proposals, which as of June 2020 had received 219 separate proposals.⁶¹

61. Los Angeles County Metropolitan Transportation Authority, “Partnerships and Unsolicited Proposals”; Schank, “Office of Extraordinary Innovation (OEI) Progress Report.”

REFERENCES

- Bolaños, Lisardo, Morghan Transue, Porter Wheeler, and Jonathan Gifford. “U.S. Surface Transportation Public–Private Partnerships: Objectives and Evidence—Extended Findings.” *Transportation Research Record* 2673, no. 12 (July 9, 2019): 290–300. <https://doi.org/10.1177/0361198119858280>.
- Briginshaw, David. “First Two RFQs Issued for Toronto’s Ontario Line.” *International Railway Journal* (blog), June 8, 2020. <https://www.railjournal.com/infrastructure/first-two-rfq-is-issued-for-torontos-ontario-line/>.
- Brinklow, Adam. “FYI, Salesforce Does Not Own Salesforce Transit Center, Park.” *Curbed SF*, August 12, 2019. <https://sf.curbed.com/2018/8/23/17773200/salesforce-park-tower-transit-center-naming-rights>.
- Cho, Aileen, J.T. Long, and Jim Parsons. “Infrastructure Investors Are Willing to Pound the Pavement.” *Engineering News-Record*, July 19, 2010. <https://advance-lexis-com.mutex.gmu.edu/document/?pdmfid=1516831&crd=2b97c237-f42a-4fd3-868e-b4771a80ccb8&pddoc-fullpath=%2Fshared%2Fdocument%2Fnews%2Furn%3AcontentItem%3A801G-H5G1-2PM2--H2BK-00000-00&pdcontentcomponentid=7964&pdteaserkey=sr26&pditab=allpods&ecomp=tzg2k&earg=sr26&prid=5cc198ee-8a87-4f10-9b25-bcbd5f905e49>.
- Continuum. “Union Station Project Details.” Accessed October 14, 2020. <https://continuumpartners.com/project-page/union-station-district/>.
- “Denver Transit Partners, LLC vs. Regional Transportation District, Complaint and Jury Demand.” Denver County District Court, Colorado, September 19, 2018. <https://wp-cpr.s3.amazonaws.com/uploads/2019/06/dtp-complaint.pdf>.
- “Denver Transit Partners, LLC, vs. Regional Transportation District, Defendant Regional Transportation District’s Counterclaims and Answer to Complaint.” District Court, City and County of Denver, Colorado, October 11, 2018. https://wp-cpr.s3.amazonaws.com/uploads/2019/06/rtd_counterclaims_and_answer.pdf.
- Esty, Benjamin C. “Why Study Large Projects? An Introduction to Research on Project Finance.” *European Financial Management* 10, no. 2 (2004): 213–24. <https://doi.org/10.1111/j.1354-7798.2004.00247.x>.
- Fitch Ratings. “Fitch Expects to Rate RTD (CO)’s Eagle P3 Series 2020 PABs ‘A-’; Outlook Stable,” November 17, 2020. <https://www.fitchratings.com/research/infrastructure-project-finance/fitch-expects-to-rate-rtd-co-eagle-p3-series-2020-pabs-a-outlook-stable-17-11-2020>.
- Good, John. “Railway Station Redevelopment Guidebook: Case Study - Denver Union Station.” Unpublished ms., January 6, 2019.

- Government Accounting Standards Board. "Public-Private and Public-Public Partnerships and Availability Payment Arrangements: Statement No. 94 of the Governmental Accounting Standards Board." Governmental Accounting Standards Series, March 2020. <https://www.gasb.org/cs/BlobServer?blobkey=id&blobnocache=true&blobwhere=1175836131783&blobheader=application%2Fpdf&blobheadername2=Content-Length&blobheadername1=Content-Disposition&blobheadervalue2=316562&blobheadervalue1=filename%3DGASBS94.pdf&blobcol=urldata&blobtable=MungoBlobs>.
- Han, Emily. "Denver Eagle P3 Begins Operations." Eno Center for Transportation, April 28, 2016. <https://www.enotrans.org/article/denver-eagle-p3-begins-operations/>.
- Hecht, Jodi. "Are Availability Payment Obligations Debt?" Public Works Financing, September 2015.
- Hewes, Will, and Sean Randolph. "Public-Private Partnerships in California: How Governments Can Innovate, Attract Investment, and Improve Infrastructure Performance." Bay Area Council Economic Institute, August 2018. <http://www.bayareaeconomy.org/files/pdf/P3inCaliforniaWeb.pdf>.
- Infrastructure Ontario and Mextrolinx. "Ontario Line Initial Business Case," July 2019, 85.
- Keeling, Brock. "Salesforce Purchases Exclusive Naming Rights to Transbay Transit Center." Curbed SF, July 11, 2017. <https://sf.curbed.com/2017/7/11/15953852/salesforce-transbay-transit-center-san-francisco-sf>.
- Los Angeles County Metropolitan Transportation Authority. "L.A. Metro Announces First Chief Innovation Officer," September 28, 2015. https://www.metro.net/news/simple_pr/l-metro-announces-first-chief-innovation-officer/.
- "Partnerships and Unsolicited Proposals." Accessed November 13, 2020. <https://www.metro.net/projects/oei/partnerships-ups/>.
- Lovell, Robert. "Denver's Landmark Eagle P3 Project." Infrastructure Journal, September 8, 2010.
- Maryland Economic Development Corporation (Purple Line Light Rail Project). "Private Activity Revenue Bonds Official Statement," June 4, 2016, 924.
- Metrolinx. "GO Expansion Full Business Case," November 2018. http://www.metrolinx.com/en/docs/pdf/board_agenda/20181206/20181206_BoardMtg_GO_Expansion_Full_Business_Case.PDF.
- Ontario, Ministry of Finance. "The New 'Ontario Line' -- Better, Faster, Smarter." In 2019 Ontario Budget, Chapter 1B: Putting People First, 2019. <https://budget.ontario.ca/2019/chapter-1b.html#section-2>.
- Organisation for Economic Co-operation and Development (OECD). Dedicated Public-Private Partnership Units: A Survey of Institutional and Governance Structures. Paris: OECD, 2010.

Peterman, David Randall. "The Railroad Rehabilitation and Improvement Financing (RRIF) Program." Washington, D.C.: Congressional Research Service, January 31, 2018.

Poole, Robert W., Jr. "Annual Privatization Report 2020: Transportation Finance." Reason Foundation, May 2020.

Railway Gazette International. "Ontario Line PPP Procurement Starts," June 8, 2020. <https://www.railwaygazette.com/projects-and-planning/ontario-line-ppp-procurement-starts/56705.article>.

Raymond James and Associates. "Weekly Interest Rate Monitor," June 1, 2020. https://www.raymondjames.com/-/media/rj/dotcom/files/wealth-management/market-commentary-and-insights/bond-market-commentary/weekly_rate_monitor.pdf?la=en.

Regional Transportation District. "Eagle P3 Project Procurement Lessons Learned." Denver, CO: Regional Transportation District, August 31, 2011. http://www.rtd-fastracks.com/media/uploads/ep3/Eagle_P3_Procurement_Lessons_Learned_Report.pdf.

Regional Transportation District (Colorado). "Official Statement Relating to \$397,835,000 Regional Transportation District (Colorado) Tax-Exempt Private Activity Bonds (Denver Transit Partners Eagle P3 Project), Series 2010," August 4, 2010. <https://emma.msrb.org/EA402484-EA315069-EA710776.pdf>.

Sakaki, Shige. "Railway Station Redevelopment: Case Studies in Japan." Vienna, Austria, November 6, 2017.

"Railway Station Redevelopment: Overview." Vienna, Austria, November 6, 2017.

San Francisco County Transportation Authority. "Salesforce Transit Center." SFCTA. Accessed October 19, 2020. <https://www.sfcta.org/projects/salesforce-transit-center>.

San Francisco Municipal Transportation Agency. "Salesforce Transit Center." SFMTA. San Francisco Municipal Transportation Agency. Accessed October 15, 2020. <https://www.sfmta.com/projects/salesforce-transit-center>.

Schank, Joshua L. "Office of Extraordinary Innovation (OEI) Progress Report." Los Angeles County Metropolitan Transportation Authority, June 23, 2020. http://boardarchives.metro.net/Board-Box/2020/200624_OEI_Progress_Report.pdf.

Schneider, Michael, Javier Tamargo, Charles Latucca, and Jennifer Mayer. "P3s in the Mid-Atlantic Region and Beyond." Presented at the 4th Annual Conference, Center for Transportation Public-Private Partnership Policy, George Mason University, Arlington, VA, April 25, 2017.

Shaver, Katherine. "Firms Managing Purple Line Construction Narrow List of Potential New Contractors." Washington Post, March 3, 2021. https://www.washingtonpost.com/local/trafficandcommuting/purple-line-construction/2021/03/03/21483c36-7c3d-11eb-b3d1-9e5aa3d5220c_story.html.

- Smith, Nancy, Patricia de la Peña, Edward Kussy, Sonika Sethi, Porter Wheeler, Jonathan Gifford, and Shirley Ybarra. "Public-Private Partnership (P3) Procurement: A Guide for Public Owners." U.S. Department of Transportation, Federal Highway Administration, March 2019. https://www.fhwa.dot.gov/ipd/pdfs/p3/toolkit/p3_procurement_guide_0319.pdf.
- Spurr, Ben. "How Ford's Ontario Line Plan Came Together in Just Three Months - with Secrecy, a Shifting Route and a Consultant." The Toronto Star. February 15, 2020, sec. News. <http://global.factiva.com/redirect/default.aspx?P=sa&an=TOR0000020200215eg2f000un&cat=a&ep=ASE>.
- Star, Ben Spurr Toronto. "Mayor Backs Deal with Province on Subways; City Would Endorse Ontario Line, Scarborough Plan as Queen's Park Cancels Upload." The Toronto Star. October 17, 2019, ONT edition, sec. News. <http://global.factiva.com/redirect/default.aspx?P=sa&an=TOR0000020191017efah000k2&cat=a&ep=ASE>.
- State of Maryland, Board of Public Works. "Board of Public Works - after Meeting Agenda Summary," April 6, 2016. <https://bpw.maryland.gov/MeetingDocs/2016-Apr-6-Summary.pdf>.
- Suzuki, Hiroaki, Jin Murakami, Yu-Hung Hong, and Beth Tamayose. Financing Transit-Oriented Development with Land Values: Adapting Land Value Capture in Developing Countries. The World Bank, 2015. <http://elibrary.worldbank.org/doi/book/10.1596/978-1-4648-0149-5>.
- The Performance-Based Building Coalition. "Public-Private Partnerships." Performance Based Building Coalition. Accessed November 10, 2020. <https://www.p3buildings.org/>.
- U.S. Department of Transportation, Build America Bureau. "MBTA Positive Train Control." Accessed May 26, 2020. <https://www.transportation.gov/buildamerica/projects/mbta-positive-train-control>.
- "Pennsylvania Rapid Bridge Replacement Project, Statewide," July 17, 2015. <https://www.transportation.gov/buildamerica/projects/project-highlights/pennsylvania-rapid-bridge-replacement-projectstatewide>.
- "Pocahontas Parkway / Richmond Airport Connector." Accessed November 11, 2020. <https://www.transportation.gov/buildamerica/projects/pocahontas-parkway-richmond-airport-connector>.
- "Private Activity Bonds." Accessed June 3, 2020. <https://www.transportation.gov/buildamerica/financing/private-activity-bonds-pabs/private-activity-bonds>.
- "Railroad Rehabilitation & Improvement Financing (RRIF)." Accessed June 2, 2020. <https://www.transportation.gov/buildamerica/financing/rrif/railroad-rehabilitation-improvement-financing-rrif>.
- "TIFIA Credit Program Overview." Accessed May 26, 2020. <https://www.transportation.gov/buildamerica/financing/tifia/tifia-credit-program-overview>.
- "Transit," April 3, 2020. <https://www.transportation.gov/buildamerica/about/resources-mode/transit>.

- U.S. Department of Transportation, Federal Highway Administration. "Financial Structuring and Assessment for Public-Private Partnerships: A Primer," December 2013. https://www.fhwa.dot.gov/ipd/pdfs/p3/p3_primer_financial_assessment_1213.pdf.
- "Guidebook for Value for Money Assessment," December 2013. https://www.fhwa.dot.gov/ipd/pdfs/p3/p3_guidebook_vfm_1213.pdf.
- U.S. Department of Transportation, Federal Highway Administration, Center for Innovative Finance Support. "Project Profile: Eagle Project." Accessed August 20, 2020. https://www.fhwa.dot.gov/ipd/project_profiles/co_eagle_project.aspx.
- U.S. Federal Transit Administration. "Best Practices Procurement and Lessons Learned Manual," October 2016. <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/funding/procurement/8286/fta-best-practices-procurement-and-lessons-learned-manual-2016.pdf>.
- "Value Capture." Accessed June 8, 2020. <https://www.transit.dot.gov/valuecapture>.
- Weimer, David, and Aidan R. Vining. Policy Analysis: Concepts and Practice. 5 edition. Boston: Pearson, 2010.
- Williamson, Richard. "Denver Commuter Rail P3, Now Fully Operational, to Refund Launch Debt." The Bond Buyer. December 1, 2020. <http://global.factiva.com/redirect/default.aspx?P=sa&an=B-BYER00020201201egc100007&cat=a&ep=ASE>.
- "Denver on the Fast Track to Finish Rail Link to Airport." The Bond Buyer. June 18, 2010, sec. Regional News. <http://global.factiva.com/redirect/default.aspx?P=sa&an=B-BYER00020100618e66i00006&cat=a&ep=ASE>.
- World Bank. "Railway Station Redevelopment Guidebook." Unpublished ms., n.d.