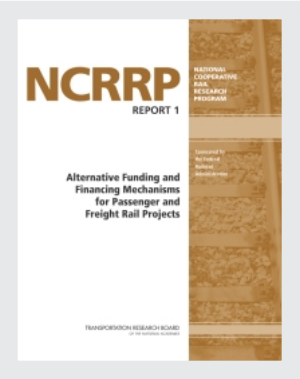

Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects

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NATIONAL COOPERATIVE RAIL RESEARCH PROGRAM

NCRRP REPORT 1

Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects

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NATIONAL COOPERATIVE RAIL RESEARCH PROGRAM

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The NCRRP was authorized in October 2008 as part of the Passenger Rail Investment and Improvement Act of 2008 (PL 100-432, Division B). The Program is sponsored by the Federal Railroad Administration (FRA) and managed by the National Academies, acting through its Transportation Research Board (TRB), with program oversight provided by an independent governing board (the NCRRP Oversight Committee) including representatives of rail operating agencies.

The NCRRP carries out applied research on problems that (1) address, among other matters, intercity rail passenger and freight rail services, including existing rail passenger and freight technologies and speeds, incrementally enhanced rail systems and infrastructure, and new high-speed wheel-on-rail systems; (2) address ways to expand the transportation of international trade traffic by rail, enhance the efficiency of intermodal interchange at ports and other intermodal terminals, and increase capacity and availability of rail service for seasonal freight needs; (3) consider research on the interconnectedness of commuter rail, passenger rail, freight rail, and other rail networks; and (4) give consideration to regional concerns regarding rail passenger and freight transportation, including meeting research needs common to designated high-speed corridors, long-distance rail services, and regional intercity rail corridors, projects, and entities.

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FOREWORD

By Lawrence D. Goldstein
Staff Officer
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NCRRP Report 1: Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects identifies alternative funding and financing tools that can be used to realize passenger and freight rail project development, including capital investments, operations, and maintenance. The research produced by Project 07-01 resulted in *NCRRP Report 1*, a comprehensive guidebook for practitioners, and a separate report summary geared to policymakers and decisionmakers. *NCRRP Report 1* provides an assessment of broad financing and funding requirements in the context of intercity passenger and freight rail systems, a detailed review of funding and financing options and associated considerations, and an in-depth assessment of implementation requirements for a broad spectrum of rail projects and services. The report summary, available separately, highlights the significant issues that underlie consideration of how to pay for rail projects and services that have an identified funding gap, including the policy considerations that must be addressed to bridge that gap.

Recent years have seen an increasing demand for passenger rail service in the United States; however, no stable source of funding exists for developing or expanding intercity passenger systems. Passenger rail operating revenues are insufficient, on their own, for either capital development or operations and maintenance and, therefore, generally depend on public funding support. In contrast, freight rail, primarily developed and operated by the private sector, typically at a profit, has access to traditional financing streams. Some short-line freight rail or corridor improvement projects, however, cannot be financed privately and require alternative funding and financing approaches to be financially viable. The key question is how to fund and finance passenger and rail projects that, on their own, have a funding gap.

Under NCRRP Project 07-01, the CPCS team was tasked to identify alternative methods for funding and financing intercity passenger and freight rail project development, including capital investment, operations, and maintenance, when traditional sources of funding and financing on their own are insufficient or inadequate. The resulting guidebook and report summary together (1) provide a "tool box" of approaches and methods for funding and financing rail projects and (2) identify a broad range of funding and financing considerations, including requirements for implementation. The guidebook clarifies the significant distinction between funding and financing and the related implications for realizing rail projects. It also identifies a framework for classifying projects in a net public-benefit vs. net-financial-returns matrix to provide context for when funding and financing models may be most appropriate. In addition, the guidebook provides a set of case studies demonstrating how to choose among and apply potential alternative mechanisms, thereby helping planners, developers, and decisionmakers to navigate through the selection, evaluation, and implementation process.

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SUMMARY

Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects

This research project sought to identify alternative revenue generation (funding) and financing methods for realizing passenger and freight rail capital investment, operations, and maintenance. The resulting resource—this Guidebook—is designed to help policymakers, planners, and others in identifying opportunities to fund and finance rail projects that otherwise could not be realized.

The scope of this research project was very broad and covered funding and financing needs and mechanisms relating to capital, operations, and maintenance of freight rail projects and services, passenger rail projects and services (notably intercity passenger rail, including high-speed rail and commuter rail) and shared corridor and corridor improvement projects (covering both shared passenger and freight corridors, and freight corridor improvement projects). Most public surface transportation infrastructure and services in the United States do not, on their own, generate sufficient revenue to cover their full costs and are dependent on public funding contributions.

A recent report noted that the combined contribution of the federal government, states, and localities to the country's highways and transit systems is on the order of $207 billion per year.[1] Similarly, most public rail projects and services (including intercity passenger rail, commuter rail, and corridor improvement projects) also require public funding contributions to be financially viable.

All intercity and commuter passenger rail operations in the United States have a funding gap—revenues generated by these services do not cover their full costs. For instance, since its establishment in the 1970s, Amtrak's operating revenues from intercity passenger rail service have never covered operating costs, let alone made any contribution toward capital investment;[2] operating losses between 2008 and 2012 ranged between $1.1 and $1.3 billion annually. Likewise, not one of the 24 publicly owned commuter rail systems in the United States covers its operating expenses from passenger revenues; cost recovery from commuter rail operations varies from 6% to 63%. Revenues from planned high-speed rail (HSR) projects in the United States are also unlikely to recover their full costs. Some short-line freight railroad projects and services and most shared passenger-freight rail corridor or corridor improvement projects (e.g., Chicago's CREATE project) also face a funding gap.

This is in contrast to most private U.S. Class I freight rail services, which typically generate revenues far in excess of capital, operating, and maintenance costs and pay a return to

[1] The PEW Charitable Trusts, *Intergovernmental Challenges in Surface Transportation Funding,* September 2014.

[2] Operating financial performance for Amtrak's services varies widely. Acela services and Amtrak services on some routes earn an operating profit, which is then used to subsidize other services. Some reforms to re-invest operating profits into their respective services have been proposed. This could strengthen services with high financial performance but increase reliance on public funding for services with poor financial performance.

shareholders. In 2013, for example, U.S. Class I freight railroads generated $13.4 billion in profits and invested more than $25 billion in railroad plant and equipment. These investments can be financed based on expected future operating profits, using a range of financial products available on commercial markets.

Rail projects and services that have a funding gap cannot be financed privately, although there may be a strong rationale for investing in these projects or services. These rail projects and services, including passenger, short-line, and freight rail corridor improvements can provide a range of public benefits (e.g., increased mobility and accessibility; regional economic development; and reduced congestion, wear and tear on roads, and emissions). Yet because public benefits are generally measured in economic rather than financial terms and accrue to society at large, rather than to private investors, public funding, in one form or another, is required for these projects to be financially feasible.

This Guidebook identifies alternative funding and financing methods for realizing passenger and freight rail capital investment, operations, and maintenance, where traditional funding sources, on their own, are insufficient.

Funding vs. Financing

Funding and financing refer to different things. **Funding** refers to the sources of revenue that can be used to pay for a project or service. Sources of funding include future revenue streams from the delivery of rail transportation services (whether freight or passenger services) and ancillary revenues or non-repayable grants or subsidies. **Financing** refers to financial mechanisms or tools to access money to pay for a project or service—generally before the project generates the necessary revenue to pay for the investments. Financing mechanisms include various forms of debt, equity, and capital leases. Financing is typically used when a project's revenues do not correspond to the cash needs of the project. The use of financing mechanisms, unlike funding, generally creates an obligation to the entity providing the financing.

There is no such thing as a financing solution to a funding problem. Short of reducing the cost of a project or service, the only solution to a funding gap is to find other sources of revenue. Often, rail projects or services with a funding gap require public funding to be financially viable—typically in the form of grants or other capital contributions (for capital investments) and/or operating subsidies (for operations and maintenance). Grants and subsidies are funding vehicles, but the money used to pay for these funding vehicles must come from somewhere. Typical sources of money for grants and subsidies include taxes and user charges.

Alternative Funding and Financing Mechanisms for Rail Projects and Services

Beyond the more typical or traditional sources of funding and financing for rail projects and services, this Guidebook identifies alternative funding and financing mechanisms that can be used to pay for freight and passenger rail projects—including operating costs (opex) and capital costs (capex). These are organized under three broad headings (see Figure S-1) and summarized in the subsequent tables:

- Service or Asset-Related Revenue (Funding) Mechanisms
- Public Revenue (Funding) Mechanisms
- Financing Mechanisms (Private and Public)

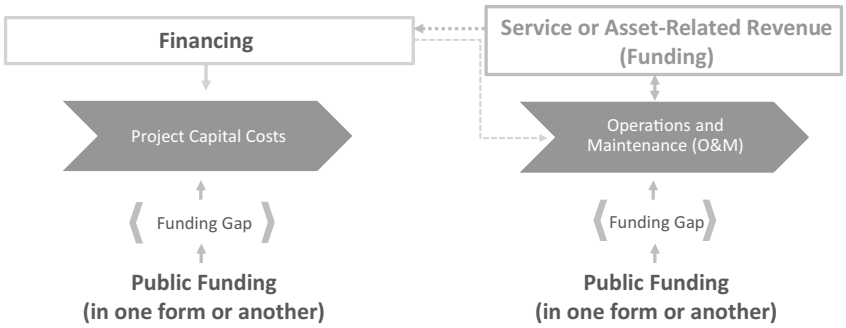


Figure S-1. Simplified representation of rail project funding and financing.

As used in Tables S-1 through S-3, the criteria used in estimating funding potential are as follows:

- **Low** funding potential ($): funding sources that contribute less than 5% of transportation revenue
- **Medium** funding potential ($$): sources contributing from 5% to 20% of transportation revenue
- **High** funding potential ($$$): funding sources that can contribute more than 20% of transportation revenue.

These are necessarily estimates and the potential for any particular funding source depends on circumstances.

Table S-1. Alternative service or asset-related, revenue-generating (funding) mechanisms.

Service or Asset-Related, Revenue-Generating Mechanisms	Freight	Passenger	Capex	Opex	Magnitude of Funding Potential ($=low, $$$=high)
Market Pricing to Maximize Fare Box Revenues (6.4.1)		✓	✓	✓	**$$** (potential to increase revenue ~ 10% to 20%)
Premium Services to Increase Service Revenues (6.4.2)		✓	✓	✓	**$-$$** (potential to increase revenue ~ 5% to 10%)
On-board and In-Station Retail Concessions (6.4.3)			✓	✓	**$** (potential to increase revenue ~3%)
Track Access Charges (6.4.4)	✓	✓	✓	✓	**$** (potential to recover marginal cost +)
Selling or Leasing Access to Railroad Rights of Way (6.4.5) (The operator and the owner may be different, which is often true of passenger operators. The benefits go to the owner.)	✓	✓		✓	**$-$$** (based in large part on the value of the land adjacent to the right-of-way corridor)
Commercial Property Development/Joint Development (6.4.6)	✓	✓	✓	✓	**$-$$** (extent of revenues depends on the size and type of the development)
Branding, Sponsorship, and Naming Rights (6.4.7)		✓	✓	✓	**$** (e.g., from $200,000 to $2m per year per rail station in major urban areas. Not often used in U.S. context)

Table S-2. Alternative public revenue (funding) mechanisms.

Public Revenue (Funding) Mechanisms	Freight	Passenger	Capex	Opex	Magnitude of Funding Potential ($=low, $$$=high)
Incremental Property Tax Revenues (for Tax Increment Financing) (6.5.1)	✓	✓	✓		**$$** (depends on the actual increase in property values generated by project – will vary considerably by case)
Special Assessment District (SAD) Fees (6.5.2)		✓	✓		**$$-$$$** (contribution varies depending on the overall capex requirements for the project and the benefits expected to be generated by the project)
Impact Fees Charged to Property Developers (6.5.3)		✓	✓	✓	**$$** (highest in strong real estate markets)
Station Parking Charges (6.5.4)		✓	✓	✓	**$-$$** (potential to generate 5% to 10% in additional revenue)
Road Tolling/Congestion Charging (6.5.5)	✓	✓	✓	✓	**$$** (more typically used to fund transit but can be applied locally for joint road/rail facilities)
Heavy Goods Vehicle (Truck) Charges (6.5.6)	✓		✓	✓	**$$$** (depends on level of charges and amount of traffic – European examples in the $ billions)
Gas Tax (6.5.7)	✓	✓	✓	✓	**$$$** (total funding potential very large – in UK, £26 billion [$40 billion] each year, 1.7% of GDP)
Car Registration Plate Auction (6.5.8)		✓	✓	✓	**$$-$$$** (funding potential very large)
Motor Vehicle Registration Fees (6.5.9)		✓	✓	✓	**$$$** (in UK, £6 billion [$10 billion] each year from motor vehicle registration fees)
Vehicle Mileage-Based User Fee (6.5.10)	✓	✓	✓	✓	**$$$** (for example, a 1-cent per mile tax would yield about $30 billion/year in U.S., with a typical driver paying about $120 per year per vehicle)
Payroll Taxes Used for Transport (6.5.11)		✓	✓	✓	**$$$** (depends on the extent of the program: geographic size of the taxation zone, tax rate, etc. In the Paris Region, generates about $4 billion per year)
Sales Tax (6.5.12)	✓	✓	✓	✓	**$$$** (total funding potential very large; sometimes a share of sales taxes is assigned to transport projects and can be used to improve rail and road improvement projects from a general fund)
Carbon Tax or Credits (Cap-and-Trade) (6.5.13)	✓	✓	✓	✓	**$$$** (in California, 1 cent/gallon would yield around $170 million/year and 20 cents/gallon would finance the entire HSR program without any other sources)

Table S-3. Financing mechanisms.

Financing Mechanisms	Freight	Passenger	Capex	Opex	Magnitude of Financing Potential and Cost
Public-Private Partnerships (PPPs) (6.6.1)	✓	✓	✓	✓	Can finance entire project if future revenue streams are sufficient and predictable.
Equipment Trust Certificates (available to private companies) (6.6.2)	✓	✓	✓		Amounts available range from about $20 million to $200 million, with interest rates equivalent to a federal rate plus 2% to 5%.
Operating Lease Certificates (available to private and public companies) (6.6.3)	✓	✓	✓	✓	Could range from $1 million to billions, cost varies by asset: Market prices – annual lease usually 10% to 25% of new asset price per year.
Finance or Capital Leasing (private and public companies) (6.6.4)	✓	✓	✓	✓	Finance leases depend on the creditworthiness of the lessee and can be used to finance many different types of assets.
Bonds with Public-Sector Backing (6.6.5)		✓	✓		Could be significant. Cost typically 25 to 30% below prime rate.
Corporate Bonds (available for private entities) (6.6.6)	✓		✓		$25 million to $1 billion+. Federal Rate +1% to +5%; interest taxable to recipients.
Mezzanine Financing (available to both private and public companies/authorities) (6.6.7)	✓	✓	✓	✓	$100s of millions for large railroads; $10 million to $100 million for smaller ones. Prime; Prime +1-5%.
Short-Term Corporate Line of Credit Financing (6.6.8)	✓		✓	✓	$20 million to $100 million. Prime rate to prime rate +5%; initiation charge.
Sale of Stock (Ownership Stake) (6.6.9)	✓	✓	✓	✓	$100s of millions for large railroads; $10 million to $100 million for smaller ones. Cost typically in range of 12% to 20%.
Tax/Investment Credits (6.6.10)	✓		✓		Varies significantly on a case-by-case basis and on state and federal tax codes.

Potential Application of Alternative Funding and Financing Mechanisms

To illustrate how alternative financing and revenue mechanisms could be used in practice, the research team assessed the potential application of these alternative mechanisms on the following U.S. rail projects, which are in planning or early development stages and all with a funding gap.[3]

- California High-Speed Rail (High-Speed Rail)
- Amtrak Virginia (I-81/US-29 Corridor) (Intercity Passenger Rail)
- Virginia Rail Express (VRE) (Commuter Service)
- Chicago CREATE (Shared Corridor)
- New Orleans Rail Gateway (NORG) (Shared Corridor)

[3] The research team's approach in selecting projects was to first ensure inclusion of at least one project per rail sector (i.e., commuter, regular intercity, HSR intercity, and freight/shared corridor). Thereafter, the research team sought projects having a funding gap. The extent of public information available was also a determining factor in project selection. The detailed case studies are included in Appendix E of this Guidebook.

The resulting case studies provide examples of very different projects; however, many of the lessons are similar:

- If a project has a funding gap after seeking all other available sources of revenue, public funding is needed if the project is to be financially viable.
- Public revenue (funding) mechanisms could raise significantly more money to pay for rail projects than revenue mechanisms from the rail project, assets and/or services themselves, but there are more barriers (often political) to obtaining such funding.
- For passenger projects, general taxation offers the greatest funding potential.

No single funding or financing tool is likely to be sufficient for most large rail projects—multiple sources of funding and financing probably will be necessary. Many of the mechanisms identified in this Guidebook are underutilized or not utilized at all, which suggests scope for increasing their use to realize rail projects.

Beyond Funding and Financing Mechanisms: Opportunities and Potential Strategies to Realize Rail Projects with a Funding Gap

Notwithstanding the other considerations and motivations that drive rail project funding and financing, the extent to which a rail project or service is expected to have a net public benefit or a net private (financial) return is a useful basis for assessing funding and financing requirements and opportunities. This is a notable area for further research and analysis.

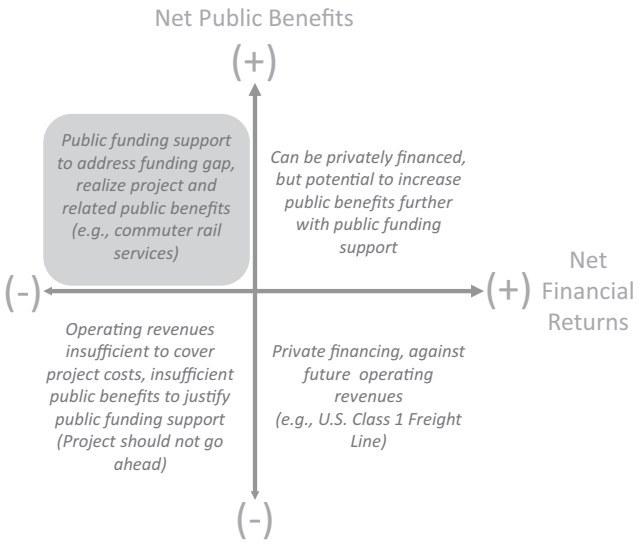
One option could be to develop and institutionalize a more robust and standardized framework, method, and set of indicators for capturing and quantifying the full range of rail project benefits and costs in future assessments of the overall benefit-cost of rail projects and services. Such a framework and related resources could be supported by evidence-based research of the actual long-term benefits of rail projects (too often a project's benefits are assessed only before a project; it would be useful to assess actual benefits ex-post to inform future benefit-cost analyses).

This framework could then be used in a more comprehensive assessment of funding and financing options and their justification. Figure S-2 presents a basis for informing the use of rail funding and financing mechanisms in terms of when they are most appropriate; Figure S-3 presents a basis for informing the use of rail funding and financing mechanisms in terms of how they can be used to achieve specific outcomes.

Other opportunities and potential strategies to promote the financial realization of rail projects, some of which exist already in some jurisdictions in the United States, include the following:

- **Establishing a stable, predictable funding source for passenger rail projects and services.** Predictable and stable public funding (subsidies) for passenger rail services is needed to plan and sustain these operations effectively. Many public funding models, including federal appropriations for Amtrak, however, are neither predictable nor stable from one year to another. This creates a problem for planning and investment.

  Virginia's Intercity Passenger Rail Operating and Capital (IPROC) Fund provides one model for predictable and stable funding. The IPROC fund provides funds to passenger rail projects that exhibit strong public benefits, with funding guaranteed year-over-year over the life of the asset, subject to meeting certain requirements and performance obligations. The $19 billion in rail funding announced as part of the Grow America Act could

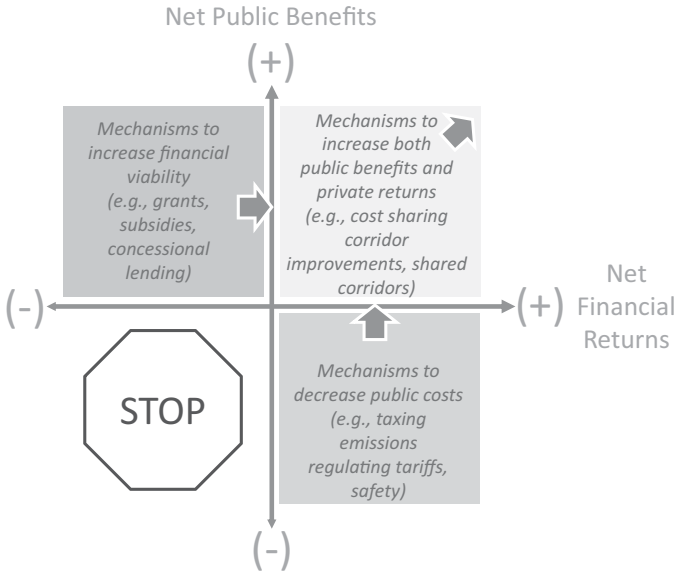


Source: CPCS

Figure S-2. Net public benefits vs. net private (financial) returns.

also help in creating more certainty about funding for rail projects and services, were it to be enacted.

- **Strengthening the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant program to improve multi-modal project planning and funding.** The TIGER grant program has proved popular as a way to help fund transportation projects that demonstrate a high benefit in relation to project costs. As a multi-modal funding program, it addresses a gap in federal funding programs, although it has not been without controversy. Nevertheless, a stable and strengthened TIGER program could be one



Source: CPCS

Figure S-3. Use funding and financing mechanisms to increase public benefits, financial viability, or both.

genesis of a much-improved approach to complex transportation issues (and associated funding requirements), including for rail projects, especially with implementation of the recommendations of the Government Accountability Office (GAO) management review.[4]

- **Establishing model institutional and commercial frameworks for complex, multi-party corridor improvement projects.** The institutional and commercial frameworks for railway development are complex, particularly for multi-party shared corridor and corridor improvement projects, and are often major barriers to obtaining funding. Several major rail improvement projects (e.g., Alameda Corridor, CREATE, and New Orleans Rail Gateway [NORG]) have had large complicated transactions involving many different parties. This has been driven by the complexity of the U.S. rail environment (i.e., multiple private railways control most of the existing rail infrastructure, except in the largest urban areas where some public rail infrastructure exists) and the complexity of the public environment (which comprises cities, counties, suburban cities, public authorities, states, and state authorities). Different approaches have been used to address this complexity. So far, each approach has been unique and largely unrelated to other experiences. It could be worthwhile to develop a set of standard practices (based on the examples herein) for dealing with the complex U.S. environment. These models could be managed by a multi-disciplinary team from a central resource (e.g., in the U.S. DOT's office).
- **Establishing expertise and resources on Public-Private Partnerships (PPPs) at the national level.** Many cities, states, and metropolitan areas are ill-equipped to identify, structure, and manage PPP deals. It is costly (and often unnecessary) to build long-term skills to structure and procure PPPs across all staff in every government department. The United States might benefit from establishing expertise at the national level, along with a repository of information on best practice and expertise in the design, procurement, implementation and management of PPP projects, generally, and rail projects specifically. Creation of the Build America Transportation Center, recently announced as part of the executive order creating the Build America Investment Initiative, is a step in this direction.
- **Improving insurance market for shared corridors.** There has been a trend by freight railroads to demand the highest possible insurance coverage and the maximum degree of transfer of liability to the non-Amtrak passenger operator whenever possible. As a result, passenger rail operators are finding it more difficult to increase or obtain new access to freight rail infrastructure. This trend has implications for increasing/advancing the development of shared corridors for passenger rail services in the United States. Potential solutions for addressing this issue are outlined herein.
- **Concessioning passenger rail operations.** Most passenger rail operations in the United States are funded in part through annual appropriations. It is difficult to obtain financing in this context because these funding streams (appropriations) are neither predicable nor stable. An alternative model, based on the successful rail franchising model in the United Kingdom, would be to tender existing intercity and commuter rail services, on the basis of the least cost (annual subsidy) required to operate the service at a pre-defined service level for a multi-year period. This would be a form of PPP, whereby the rail service is provided on a contractual, rather than annual, appropriations basis.

[4] Management Report MAY 2014: Surface Transportation: Actions Needed to Improve Documentation of Key Decisions in the TIGER Discretionary Grant Program.

Conclusions

No silver bullet financing model or truly new and previously unknown source of revenue can be accessed to fully fund and finance rail projects that have a funding gap.

The research identified and indicated the potential importance of several alternative funding and financing mechanisms that could be used to realize passenger and freight rail projects and services, where traditional funding sources, on their own, are insufficient.

In general, if projects can be properly structured, knowledgeable private financing institutions and private capital are available to invest in rail projects. What is lacking is a mechanism to fund such projects.

This Guidebook identifies other opportunities and strategies for promoting the realization of rail projects or services that have a funding gap. However, using these mechanisms and approaches requires careful consideration and making hard decisions—to raise money from the public, to allocate scarce public resources to rail projects, and potentially to disrupt the status quo in the funding and provision of rail services. Many of these decisions may be politically sensitive. Nevertheless, if the general premise is that a rail project or service is worthwhile and delivers value—a net benefit—then there could be a strong justification for making such decisions.

As and when new funding and financing mechanisms are put to use in the United States, further research on their application and results would be important and beneficial. Such research could help disseminate lessons and promote the use of the funding and financing mechanisms that prove to be most effective in realizing rail projects, given different contexts.

CHAPTER 1

Introduction

1.1 Background

Most public surface transportation infrastructure and services in the United States do not, on their own, generate sufficient revenue to cover their full costs and are dependent on public funding contributions. A recent report noted that the combined contribution of the federal government, states, and localities to the country's highways and transit systems was on the order of $207 billion per year.[5] Similarly, most public rail projects and services, including intercity passenger rail, commuter rail, and corridor improvement projects, also require public funding contributions to be financially viable.

Both passenger and freight rail projects and services require significant capital investment as well as ongoing funding for operations and maintenance. Yet, there are significant differences in how passenger and freight rail projects and services are funded and financed. Generally, most freight rail services in the United States generate sufficient operating revenues to cover their capital, operating, and maintenance costs and they are operated as profitable private businesses. U.S. passenger rail projects and services, on the other hand, do not generate sufficient operating revenues to cover their operating and maintenance costs, let alone capital costs. This is also true for some short-line freight railroad projects and services and most shared passenger-freight rail corridor or corridor improvement projects.

From a financial standpoint, these projects and services have a "funding gap" and require other sources of funding to be viable. Nevertheless, many of these projects can generate important, non-market public benefits, such as improved mobility and access, regional economic development, reduced congestion and wear and tear on roads, and reduced environmental emissions. Although such public benefits can create a strong rationale for the projects in question, they do not on their own generate funding sources to pay for these projects.

The question then is: how to pay for these projects?

The research addresses this question by providing a consolidated set of alternative funding and financing mechanisms that could be used to help pay for passenger and freight rail projects that have a funding gap. This research project also presents specific strategies, approaches, and considerations for funding and financing rail projects in the United States.

[5] The PEW Charitable Trusts, *Intergovernmental Challenges in Surface Transportation Funding,* September 2014.

1.2 Project Overview

1.2.1 Objectives

The objective of this research was to identify alternative revenue generation (funding) and financing methods for realizing passenger and freight rail capital investment, operations, and maintenance. The research project ultimately sought to provide a resource to help policymakers, planners, and others identify ways to fund and finance rail projects that otherwise could not be realized.

1.2.2 Scope

The scope of this research project was broad and covered funding and financing needs and mechanisms relating to capital, operations, and maintenance of

- Freight rail projects and services (in particular short lines and regional railroads);
- Passenger rail projects and services (particularly intercity passenger rail and including high-speed rail and commuter rail); and
- Shared corridor and corridor improvement projects (covering both shared passenger and freight corridors along with freight corridor improvement projects).

Urban metro and light rail projects and services were not included in the scope of this research project, although some of the identified funding and financing mechanisms identified might be relevant to these rail sub-sectors.

1.2.3 Structure

This research project was undertaken in four steps as outlined in Figure 1-1. This Guidebook is the product of the final step and reflects the research undertaken in previous steps.

1.3 Purpose of This Guidebook

This Guidebook provides approaches and mechanisms to help fund and finance rail projects and services that have a funding gap. It is not intended to prescribe or recommend specific funding or financing tools, nor are all the funding and financing mechanisms in this Guidebook appropriate for every project. Rather this Guidebook is intended as a resource for policymakers, planners, and other stakeholders in identifying and considering potential funding and financing models for use in realizing specific projects.

Figure 1-1. Project steps.

CHAPTER 2

U.S. Rail Industry Structure and Financial Dynamics

2.1 Rail Project/Service Types and Their Financial Dynamics

Rail projects and services can differ substantially, and so can their funding needs and associated financing. This chapter discusses different types of freight and passenger rail projects and operations in the United States and basic related financial dynamics.

2.1.1 Freight Rail

Generally, there are two types of freight rail operations in the United States:

- Class I freight railroads[6] are large railroads, with extensive operations and multi-state or transcontinental track networks. Seven Class I freight railroads operate in the United States: BNSF, Union Pacific, CSX Transportation, Norfolk Southern, Kansas City Southern, CN Rail, and CP Rail.
- Short-line and regional railroads include the more than 550 regional and short-line rail systems that are mostly privately owned. Regional and short-line freight railroads typically provide services over short distances and sections of track. In most cases, they connect small communities or remote industries to the larger freight rail network of Class I railroads.

In virtually every case, freight rail operations are for-profit businesses, although some short lines require financial support to be viable.

2.1.2 Passenger Rail

This research project considered the funding and financing requirements for intercity passenger rail (including high-speed rail) and commuter rail projects and services as discussed below.

- Intercity passenger rail. Amtrak is the main intercity passenger rail operator in the United States, although some states and private companies also operate services with intercity characteristics. On some routes, especially long-distance routes through scenic areas, passengers are tourists for whom the rail trip is part of the holiday and not just a form of transportation.
- High-speed rail (HSR) projects are intended to provide faster intercity passenger rail service, typically at speeds in excess of 125 miles per hour (mph).[7] Although HSR is well established

[6] The Surface Transportation Board (STB) defines a Class I railroad in the United States as "having annual carrier operating revenues of $378.8 million or more" after adjusting for inflation using a Railroad Freight Price Index developed by the Bureau of Labor Statistics (BLS). (49 *CFR* Part 1201, General Instructions 1-1, GPO, 2007).
[7] *U.S. Code Title 49.* 1 March 2012—Definitions. Retrieved July 9, 2013.

in Europe and Asia (where speeds in excess of 185 mph [300 km/h] are achieved), for various historical, geographic, and market reasons, only Amtrak's Acela Express service—between Boston and Washington, DC—comes close to HSR, achieving speeds of up to 150 mph on some short sections of the line. Other HSR projects are in planning, with the most advanced being in California linking the Los Angeles and San Francisco areas.

Although there is no single standard definition of high-speed rail worldwide, most definitions associate high-speed trains with speeds of at least 125 mph (200 kilometers per hour [km/h]).

- Commuter rail projects and services are intended to transport people between suburban or "bedroom" communities and large urban centers and sometimes also serving suburban activity centers. Commuter rail stations are generally closer together and train frequency is typically greater than intercity passenger rail service. The Caltrain service linking San Francisco and San Jose (and Gilroy) in California, and services provided by Metro-North in New York City, are examples of commuter rail services.

Passenger rail projects and services in the United States, whether intercity or commuter, generally focus on providing a public service and associated benefits, rather than delivering for-profit financial returns, as is so with most U.S. freight railroads.

2.1.3 Shared Corridors and Corridor Improvement Projects

Shared passenger/freight corridors involve the shared use of rail infrastructure. For instance, with the exception of some Amtrak-owned lines in the North-East Corridor (NEC), Amtrak operates passenger services on tracks owned by private freight rail companies, paying fees to use the track. Many commuter services operate over lines shared with freight services; private freight and government-owned commuter rail companies pay Amtrak for use of some Amtrak-owned lines in the Northeast United States.

That most intercity and commuter rail passenger services in the United States operate on private freight railroad-owned track is notably different than in most international jurisdictions, where rail infrastructure is typically owned by public or quasi-public entities that then provide access to passenger and freight railroads at a rate typically below commercial terms (and supported by subsidies).

Corridor improvement projects, including the Alameda Corridor in California, CREATE in Chicago, and the Heartland Corridor on the United States East Coast, are designed to improve capacity and fluidity on particular rail corridors and/or to reduce road/rail interactions along certain routes.

Although corridor improvement projects can offer private benefits as well as public benefits, they are typically not commercially viable on their own and require some form of public funding support.

2.2 A Brief History of the U.S. Rail Sector and Financial Implications

Until the 1970s, freight and intercity passenger rail services in the United States were provided exclusively by private companies. Up to this time, the rise of affordable passenger transportation by automobile and commercial aircraft had culminated in a significant decline in rail passenger traffic and associated losses for railroads. The private railroads were prevented by regulation from abandoning passenger services, and many were also facing bankruptcy partly as a result. Confronted with the choice of insolvent railroads or providing direct public support for passenger losses, in 1970 Congress undertook a major restructuring initiative and formed the National Rail Passenger Corporation (Amtrak), a private "as if for-profit" corporation (all shares owned by government) to take over most intercity passenger rail services. Under the new structure (still in place today), freight railroads have ownership of most rail infrastructure, but are required by law to allow Amtrak passenger trains to operate over their lines upon payment of "variable cost" access charges.[8]

Even after the establishment of Amtrak, heavy regulations on the freight railroad industry (including limiting the railroads' ability to abandon lines and lower tariffs in order to attract traffic) led to growing financial challenges for freight railroads and several bankruptcies.

In 1980, deregulation of the railroad industry (among other industries[9]) was carried out through the Staggers Act, which effectively freed railroads to make decisions in their own commercial interests, including abandoning under-performing freight services, setting tariffs freely,[10] and negotiating contracts on a confidential basis with shippers, with no government interference. As a result, freight railroads in the United States were able to turn around their operations to become profitable, as they largely are today.

2.2.1 Freight Context in the United States

Freight rail systems in the United States are almost exclusively privately owned. The sector is dominated by seven large Class I private railroad companies, including subsidiaries of two private Canadian rail companies.[11] Combined, they operate over 95,000 miles of track (excluding trackage rights) and over 120,000 miles of track (including trackage rights), originating 2.3 billion tons and carrying 1.7 trillion ton-miles of freight.[12] The Class I railroads account for 94% of all rail freight revenue in the United States. The remaining freight is carried on short-line and regional railroads.

In virtually every case, freight rail operations in the United States are for-profit businesses. The larger freight railroad companies are self-financing (infrastructure and operations) and require no public support. All Class I railroads finance investments from their own cash, the sale of stock (equity), shipper finance, and conventional debt instruments available on the commercial market.

All Class I railroads have investment grade credit ratings, making them attractive and relatively secure long-term investments in the case of both equity and debt. Indeed, some Class I railroads have issued general corporate bonds with a 100-year term in recent years—an extremely

[8] There are some exceptions to this ownership and charging structure. Amtrak owns the infrastructure along some parts of the North-East Corridor, where it imposes access charges on private freight and public commuter operators.
[9] Airline deregulation (Airline Deregulation Act of 1978) and trucking deregulation (Motor Carrier Act of 1980).
[10] There is still tariff oversight by the U.S. Surface Transportation Board, an independent agency administratively housed within the Department of Transportation. Shippers can bring excessive tariff charges to the STB where these cases are adjudicated.
[11] BNSF: Burlington Northern Santa Fe Railway; UP: Union Pacific Railroad; CSX: CSX Transportation; NS: Norfolk Southern; KCS: Kansas City Southern Lines; CP-SOO: Canadian Pacific, Soo Line; CN-GT: Canadian National, Grand Trunk.
[12] AAR, *Railroad Facts,* page 3, 2013.

long term by any market standard. Most corporate debt instruments rely on the company's underlying balance sheet.

> Typical cost of money (interest rate) for the strongest Class I railroads is about 2.5% above the U.S. treasury rate (currently 2% on 10-year bonds).

The cost of debt for strong short-line holding companies (e.g., Genesee & Wyoming and Fortress) is not much more expensive than for Class I railroads, but it can be higher for smaller regional and shoreline rail entities—many smaller short lines do not have access to debt markets.[13] These smaller private entities often cooperate with larger private freight rail systems to help finance projects important to both. Smaller short lines are also the major beneficiaries of federal, state, and local financing programs in the United States (Appendixes A and B list federal and state rail funding and financing programs). The federal Railroad Rehabilitation & Improvement Financing (RRIF) Program, for example, seeks to address the challenges that smaller short-line railroads have accessing commercial financial markets.

2.2.2 Intercity Passenger Rail in the United States: Amtrak

Amtrak is the main intercity and long-distance passenger rail operator in the United States,[14] moving passengers over 21,200 miles of routes across three types of service: 15 long-haul "national" system train lines, 25 short-haul, mostly single-state train lines, and the North-East Corridor service between Boston and Washington, DC, via New York City.[15]

Most track along which Amtrak trains run is owned by private freight railroads, which charge Amtrak access charges based on the short-term variable cost of accessing the track (the additional costs incurred by the railroad as a result of Amtrak trains operating on the tracks). The basic costing method (short-term variable costs) was agreed between railroads and Amtrak when Amtrak was formed. The particular charges (but not the method) are negotiated on a case-by-case basis and are subject to confidential agreements between Amtrak and the private railroads in question. The exception is about 365 miles of track along the NEC corridor, which was acquired by Amtrak in 1986, along which tenant commuter and freight operators pay access charges to Amtrak.[16] Amtrak purchases or leases equipment, primarily passenger cars and locomotives, and related maintenance infrastructure under capital leasing arrangements.

Amtrak is funded through a combination of ticket sales, revenues from third parties, and government support. The sources of Amtrak's operating revenues in 2012 are presented in Figure 2-1.

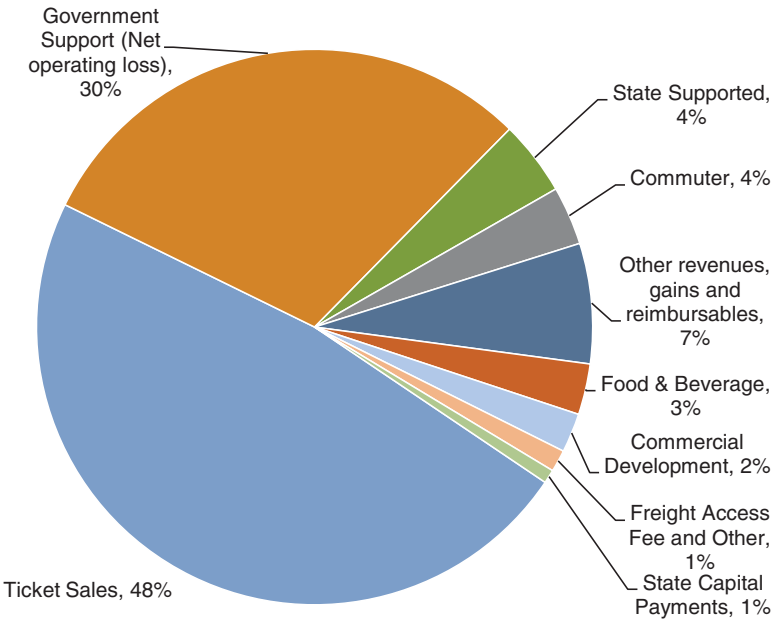
Since its establishment in 1970, Amtrak's operating revenues have never covered operating costs, let alone made any contribution toward capital investment; operating losses between 2008

[13] In part because they are too small to be able to afford the administrative costs and fees necessary for access to debt markets; some may be marginally profitable and unable to access commercial debt markets or bank financing.

[14] Some commuter-style services offering intercity passenger transport (e.g., New Jersey Transit moves between New Jersey and New York City, and Metro-North Railroad services New York and Connecticut. SEPTA provides service from Trenton, NJ, to Newark, DE. CalTrans operates the Capital Corridor between San Jose and Sacramento).

[15] Lane, R., D. Schned and P. Todorovich. 2011. *High-Speed Rail International Lessons for U.S. Policy Makers.* Policy Focus Report, Lincoln Institute of Land Policy.

[16] Louis S. Thompson. 2005. *Options for Federal Ownership of the Northeast Corridor (NEC) Infrastructure.* Available from www.tgaassoc.com



Source: CPCS Analysis of Amtrak Annual Report, 2012
[Latest available at the time of writing]

Figure 2-1. Amtrak operating revenue sources, 2012.[a]

[a] Breakdown of categories: Commuter: Amtrak operates commuter services on contract to local authorities on a cost-based fee structure; State support: Revenues from state governments that pay to receive more shorter-haul services than Amtrak would otherwise provide; State Capital Payments: Revenues from the amortization of state funds used to acquire depreciable assets; Other: Transportation revenue from use of Amtrak-owned tracks and other services; revenue from reimbursable engineering and capital improvement activities; Commercial development: revenue from retail, parking, advertising, real property leases/easements/sales, right-of-way fees; Freight access fee and other: revenue from the use of Amtrak-owned tracks by freight railroad and commuter rail companies and other gains.

and 2012 ranged between $1.1 and $1.3 billion annually.[17] However, operating financial performance for Amtrak's services vary widely: the Acela service on the Northeast Corridor, for example, earns an operating profit, which has been used to subsidize other services. On state corridors, state DOT contributions have been used to narrow the funding gap where states have determined the public benefits merit public funding. Long-distance services also have a funding gap, but are funded because Congress has seen the need for public investment in Amtrak's national network to provide more transportation options to communities that are remote and not well served by other modes. Amtrak's operating losses, as well as its capital costs, are covered largely through appropriations from the federal budget.

Amtrak has also made use of federal financing programs. For example, in 2010 it executed a loan agreement with the FRA's RRIF program for $562.9 million to be used toward the purchase of 70 new electric locomotives, maintenance facility upgrades, and spare parts.[18] This RRIF financing was raised against future funding from ticket revenues on the Northeast Corridor.

[17] Amtrak Annual Reports, years 2009 through 2012. Available from www.amtrak.com
[18] Amtrak News Release "Amtrak receives $569.2 million RRIF loan to fund new generation of electric locomotives," June 29, 2011. http://www.amtrak.com/ccurl/913/848/ATK-11-098_Amtrak_Statement_on_,0.pdf (accessed July 15, 2013).

As a private corporation (with most shares owned by the federal government[19]) Amtrak has the legal ability to borrow from private markets. It has done so extensively in the past but, following unmanageable debt burdens in the early 2000s, is now being restricted in its borrowing capacity.[20] Specifically, Section 205(g) of the Passenger Rail Investment and Improvement Act (PRIIA) of 2008 provides that Amtrak may not incur more debt after the date of enactment of the Act (October 2008) without the express advance approval of the government.

Both the Grow America Act and the PRIIA identify reforms that bring more transparency to managing and reporting Amtrak financial performance (e.g., reinvesting the above-the-rail profits into the NEC, and relying on public funding instead of other ticket revenue to pay for long-distance service).

2.2.3 HSR in the United States

The only HSR services in the United States are Amtrak's Acela Express trains and some NEC regional trains operating in some sections of the NEC at up to 150 mph and 125 mph, respectively (although average speeds are much lower).

The United States has a long history of attempts to establish high-speed rail, dating as far back as 1965 under the High Speed Ground Transportation Act. There are two main approaches to building high(er) speed rail:[21] (1) Improving existing tracks and signaling to allow trains to reach speeds of up to 110 mph, generally on track shared with freight trains;[22] and (2) building new tracks dedicated to high-speed service to allow trains to travel at speeds of 200 mph or more.[23]

The FRA defines three categories of high(er) speed rail corridors:

- Core Express services: frequent trains at 125–250+ mph in the nation's densest and most populous regions;
- Regional services: 90–125 mph service between mid-sized and large cities; and
- Emerging services: (up to 90 mph) connecting communities to the passenger rail network and providing a foundation for future corridor development.

Figure 2-2 shows the proposed priority HSR corridors by type of service.

Many of the existing federal and state funding programs (see Appendixes A and B) can be used to fund HSR projects. However, the largest and most recent funding support for HSR was initiated through the PRIIA 2008, which authorized federal funding for Amtrak and state-led efforts to develop HSR corridors between 2009 and 2013. Shortly after PRIIA was signed into law, the Act became the vehicle for appropriating $8 billion for high-speed rail under the American Recovery and Reinvestment Act (ARRA). An additional $2.5 billion for high-speed rail was

[19] In addition to the federal government (represented by the Department of Transportation) Amtrak has at least four private shareholders—some of whom acquired their shares from the original railroads that participated in Amtrak's formation.
[20] In the late 1990s and early 2000s, Amtrak took on significant commercial debt for capital improvement projects. The debt burden reached approximately $4 billion by 2002/3 and significant resources were required to service debt repayments. The debt burden has now been reduced to approximately $1.3 billion through repayments and refinancing activities.
[21] Congressional Research Service. "The Development of High Speed Rail in the United States: Issues and Recent Events," June 28, 2012.
[22] Rehabilitating new track is a lower cost option, but results in limitations: (1) some aspects of the rail infrastructure (e.g., curves and at-grade road crossings) will always limit speed improvements; (2) most existing track is used for freight trains that operate at slower speeds and operational considerations may ultimately constrain the speed of passenger trains; and (3) FRA regulations limit train speeds on routes that handle both freight and passenger traffic.
[23] The typical costs per mile are much higher for new tracks—a major deterrent to this option. Other challenges with building new dedicated track include that, in order to attain high speeds, freight trains would be prohibited from the track and would also therefore not contribute to covering construction or maintenance costs.

Source: Federal Railroad Administration, High-Speed Intercity Passenger Rail Program: Federal Investment Highlights, February 2, 2012

Figure 2-2. Proposed US high-speed rail corridors.

appropriated by Congress in the 2010 budget. These appropriations became the centerpiece of the Obama Administration's High-Speed and Intercity Passenger Rail (HSIPR) program, a competitive grant scheme administered by the FRA.[24]

Nearly 85% of funding awarded by the HSIPR in early 2012 was concentrated in six corridors. Investments in five corridors seek to upgrade existing freight and Amtrak lines: Seattle-Portland; Chicago-St. Louis; Chicago-Detroit; the Amtrak NEC; and Charlotte-Washington, DC. In the sixth corridor, Los Angeles-San Francisco, funding is for construction of a new high-speed line.[25] States are also contributing to the development of HSR, and some have established dedicated funding streams for conventional intercity and high-speed passenger rail.

2.2.4 Commuter Rail in the United States

At the time of writing, 24 commuter rail systems were owned and operated by state and local transit agencies or authorities across the United States (see Appendix C).

The ownership of track infrastructure along which commuter trains run varies across the country. In some instances, transit agencies own the track and use it exclusively or provide

[24] Lane, R., D. Schned and P. Todorovich. 2011. *High-Speed Rail International Lessons for U.S. Policy Makers.* Policy Focus Report, Lincoln Institute of Land Policy.
[25] FRA, High Speed Intercity Passenger Rail Program: Federal Investment Highlights. February 2, 2012.

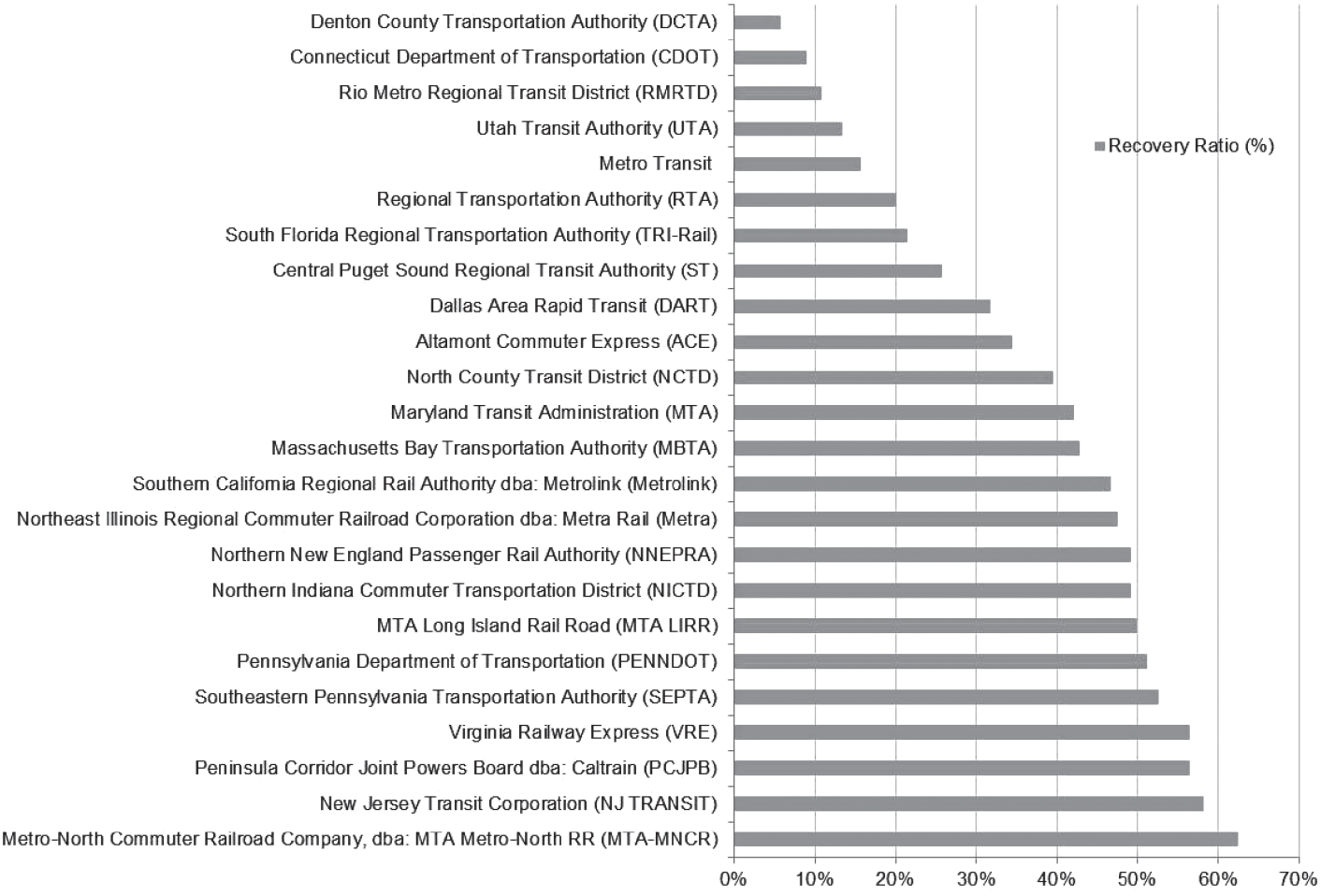
trackage rights to freight rail companies and/or Amtrak. In other cases, commuter rail operators operate exclusively on track owned by freight rail companies and/or Amtrak. Regardless of the structure, track owners charge rail operators track access fees.

Commuter rail agencies typically do not have the statutory right to access freight railroad companies' track and must negotiate track access fees with freight railroads on a case-by-case basis. Commuter agencies that wish to increase current services must negotiate additional track access rights and fees on a case-by-case basis. In such cases, the agencies generally invest in infrastructure improvements to provide the extra capacity as a condition of access.

None of the 24 publicly owned commuter rail systems in the United States cover their operating expenses from passenger revenues. As shown in Figure 2-3, passenger cost recovery from operations varies from 3% to 63%. Most systems achieve less than 50%. The recovery ratio is the percentage of operating expenses covered by passenger revenues.

Overall, the funding sources for commuter rail in the United States can be broken down into four high-level categories based on the original source of the funds:

- Directly generated revenues acquired by the public transit agency by its own activities, including fare receipts, taxes levied by the system, sale or leasing of development rights to land and existing facilities, and other revenues (e.g., advertising, concessions, and parking revenues);



Source: CPCS analysis of Federal Transit Administration's 2012 National Transit Database (NTD), 2012 NTD Data Tables, "Fare Per passenger and Recovery Ratio." Downloaded from: http://www.apta.com/resources/statistics/Pages/NTDDataTables.aspx (accessed August 13, 2014). The recovery ratio is the percentage of operating expenses covered by passenger revenues.

Figure 2-3. Commuter rail systems and passenger fare recovery, 2012.

- Local revenues from taxes or fees generated by a local or regional government (e.g., local sales taxes or income tax, a property tax, or other local taxes);
- State revenues from taxes or fees imposed by a state government; and
- Federal revenues originating from federal government funding programs.

Given that operating revenues do not cover operating costs, all of the funding for capital expenditures (e.g., rolling stock, track construction, and maintenance—where applicable) must be funded from other sources.

How the U.S. Rail Market Differs from Most International Rail Markets and Implications for Funding and Financing

This research project reviewed international examples of rail funding and financing models to identify potential lessons for the United States. Specifically, the research reviewed passenger and freight rail revenue generation and financing models in the United Kingdom (UK), elsewhere in the European Union (EU), and Australia. A summary of this global review is provided in Appendix D.

The structures of the rail sectors in most international markets are significantly different from those in the United States—many of the funding and financing models used in such jurisdictions are not applicable to the United States. The most significant of these differences are as follows:

- **Ownership of the rail network and control of rights of way.** The rail network in the United States (and by extension the rail rights of way) is predominantly owned and controlled by private freight railroads. In most international jurisdictions, the rail network (including track, stations, and yards) is predominantly owned and controlled by government or quasi-government agencies.
- **Integration and access.** Freight railroads in the United States are **vertically integrated,** controlling both the rail network and freight operations. Access to the freight railroad network, including by passenger operators, is subject to private access agreements. In the international jurisdictions reviewed, freight and passenger companies are becoming more and more **vertically separated** from the rail network operator and provide train services under regulated open-access regimes.
- **Competition:** Unlike the United States, in the international jurisdictions, freight companies compete "above the rail"[a] to provide services, as do intercity passenger operators.

Private provision of passenger rail service. In international markets, local, regional (and sometimes intercity) passenger rail services are often operated by the private sector under limited-term contracts or franchises, awarded by public tender. Although management contracts exist in the United States, the more extensive franchise model is not used for passenger rail in the United States.

Table 2-1 summarizes key differences in rail industry structures in the US vis-a-vis international markets reviewed.

[a] Competition among two or more operators on the same rail infrastructure.

Table 2-1. Comparison of US market structure with international jurisdictions, and related funding and financing implications.

Country/ Region	Rail Infrastructure Ownership	Freight Operators	Passenger Rail Operations	Rolling Stock
US	Majority of cross-country tracks privately owned by freight railroads. Amtrak owns some track in North-East Corridor. Public agencies own some commuter tracks.	Private Class I railroads operate 100% commercially without subsidy. Some smaller short line/regional railroads receive support from state and/or federal government.	Public-sector companies that receive public support for operating and capital costs not covered by revenues. A few private operators (e.g., niche tourism services).	Owned outright, financed through a special rolling stock bond (equipment trust certificate) or acquired through leasing contracts of various lengths.
UK	Network Rail (a not-for-dividend private company which has no shareholders and whose borrowing is mainly backed by a government guarantee) owns virtually all rail infrastructure and charges track access fees to both freight and passenger operating companies. Network Rail receives financing from the government for infrastructure costs not covered by track access revenues.	Private "freight operating companies" compete on open-access commercial basis on track owned by Network Rail.	Mostly private "Train Operating Companies" (TOCs) that operate on a franchise basis, with contracts between 7 and 15 years. TOCs receive a subsidy or pay a premium to the government based on franchised lines and specified services and depending on the extent to which the above rail service generates a loss, or a profit. TOCs run on Network Rail track.	Typically leased from privately owned rolling stock ownership companies (ROSCOs).

(continued on next page)

Table 2-1. (Continued).

Country/ Region	Rail Infrastructure Ownership	Freight Operators	Passenger Rail Operations	Rolling Stock
EU	Owned and managed by state-owned companies. Under EU rules, infrastructure must be managed by a company that is separate in its decision-making from any operators.	Public sector-owned companies in most cases, private companies in others. Must allow competition.	For cross-border services, public or private, as long as there is potential competition for operations "above the rails." Some countries have not yet opened competition for domestic services.	Owned by operating companies, which for the most part are state entities.
Australia	Two types of systems: Common carriage network: states own infrastructure and provide open access to private operators. Private freight railroads: private companies own infrastructure. Some are required to provide open access. Other isolated lines are dedicated to commodities mines with no requirement for open access.	Private companies	Commuter rail operators are public-sector owned, except in Melbourne where services are franchised to a private operator. Intercity services in Queensland and New South Wales are operated by state-owned companies. Some long-distance services are operated by a private company, without subsidy.	Mostly owned outright by operators. Some use of leasing structures.
Japan	HSR lines constructed pre-privatization are owned by private Japan Railways (JR) Passenger Companies. New HSR lines (constructed post-privatization) are generally owned by the national government.	Private company (JR freight) pays to access tracks owned by JR Passenger or other companies	Private JR Passenger Companies	Owned by private companies.

CHAPTER 3

Rail Project Costs and Financial Considerations

3.1 Rail Project Costs

Costs are involved in every stage of a typical rail project's lifecycle. Figure 3-1 illustrates the typical steps in the railroad project (blue arrows) and the relative cost of each stage (orange columns). The most significant costs, and by extension the major funding and financing requirements, occur during the construction and operating phases of the project. The funding and financing approaches and mechanisms in this Guidebook focus on these two key project phases.

3.2 Capital Expenditures (Capex)

Depending on the project, a rail project's design can involve the detailed design of the railroad alignment and supporting infrastructure (e.g., bridges/culverts and signaling systems) as well as rolling stock design. A very rough rule of thumb is that detailed design represents 10% of a project's total capital costs. The construction of a rail project accounts for the largest share of a project's costs. Additional costs include purchase of (or securing access to) land for the rail project, including the right of way and associated facilities (e.g., stations, yards, and maintenance facilities). In broad terms, the capital cost of rail projects can be grouped into two categories: rail infrastructure and rolling stock.

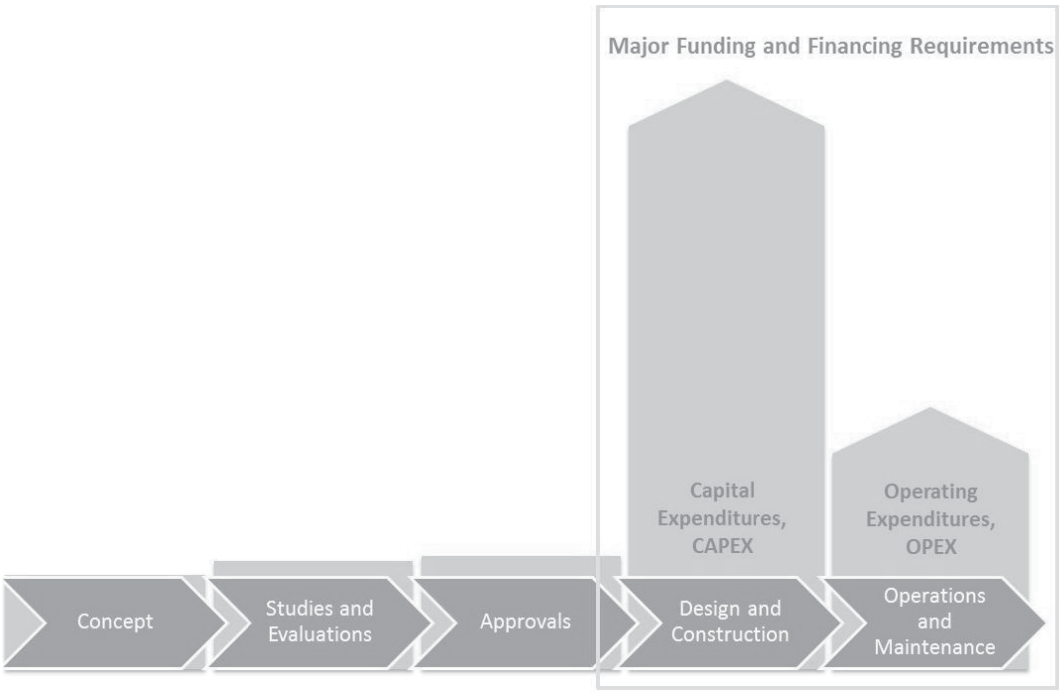
3.2.1 Rail Infrastructure

Rail infrastructure consists of two primary components: land (right of way) and rail infrastructure.

Land (Right of Way)

Rail infrastructure is constructed on what is known as the right of way. Ownership, possession, or guaranteed access to the right of way is a necessary precondition for any rail project implementation and for securing financing. Two key characteristics of the right of way are its control (e.g., who controls it and owns the right to sub-lease or allow other rail operators to use it) and whether access to the full right of way is restricted or limited in any way (e.g., is access limited to conducting rail transport or does access extend to allowing other uses, or include air rights, or sub-surface rights).

Generally, private freight railroads own and control most rail rights of way in the United States. Many railroad operators have reciprocal arrangements to access each other's right of way. Approximately 27% of the freight line-miles in the United States include more than one freight operator. In some cases, the ability to use another railroad's lines is simply a commercial transaction (e.g., a trackage rights agreement allows Railroad Company A to operate on a specific section of Railroad Company B's network for a fee, usually based on gross-ton-miles but also sometimes on trains, train-miles, or car-miles). The right for one rail company to use the right



Source: CPCS

Figure 3-1. Rail project lifecycle costs (conceptual).

of way of another rail company may also be imposed by a court or regulatory authority (e.g., STB) as a condition of a merger or as a condition of a use agreement from a third party. Class I freight railroads in the United States and Canada are required to allow intercity passenger operators Amtrak and VIA Rail, respectively, to operate on certain parts of their network (for a fee).

The right to use the land over or under the right of way is also a valuable asset. Both public and private rail companies have developed property over and under their right of way or sold the rights for such development to others outside of the railroads sector (e.g., property development, access for fiber-optics, pipelines, and electrical power distribution). Few people are aware that much of downtown Chicago is built on the air rights over private rail rights of way. These rights can represent a significant asset value in financing rail projects.

Rail Infrastructure Components

Rail infrastructure components typically include

- Basic rail system components such as the rail, crossties (also called sleepers in the international rail community), ballast, and the fastening systems that connect rail and crossties.
- Supporting rail infrastructure, including bridges, tunnels, power stations and sub-stations, track switches and crossovers that allow trains to change tracks, maintenance depots, workshops, and storage or marshalling yards. These components add cost and complexity and many of them have their own financing possibilities. For example, rolling stock manufacturing companies have financed maintenance depots and workshops in exchange for equipment sales and long-term maintenance contracts.
- Passenger stations, office buildings and other facilities such as parking lots. Each of these assets has financing mechanisms dependent on the revenue they are expected to generate. Sometimes passenger rail operators sell the development rights over and around stations in exchange for the developer building and maintaining the station to the specification of the rail company.

- Signal and train control systems, such as display systems, signal boxes, some wayside sensors on the rail line, communications cables connecting the local signals with the rest of the network, and power distribution systems providing power to operate the systems. Some rail lines are electrified—using electric locomotives or trains—so the infrastructure may include a means to distribute electrical power including an overhead catenary or third-rail system.

The per-mile cost of constructing and maintaining railroad infrastructure varies greatly depending on the type of railroad, taking into consideration a whole range of factors, including

- Population density in the area, with more densely populated urban areas possibly requiring additional investment (e.g., underground or elevated tracks, among other options);
- Geography/topography (e.g., bridges, tunnels, and urban construction);
- Type and number of tracks required, and acceptable gradients and curvatures (e.g., a single-track line used by occasional slow diesel freight trains can be built to much lower standards than a heavy haul freight line or a line used by frequent high-speed electric trains);
- Price and access to equipment (e.g., locomotives and signaling equipment);
- Climate (e.g., humidity, cold, sand, and snow); and
- Access to labor and cost of labor (e.g., expensive workers or lack of trained workers).

Very generally, rail infrastructure construction costs can range from $2 million per mile in flat rural areas to $300 million per mile or more in urban areas.

3.2.2 Rolling Stock

The other major category of rail asset is rolling stock. Examples of rolling stock are presented in Figure 3-2.

Freight Rail Rolling Stock

For freight railroads, rolling stock includes locomotives and freight cars of various types. Most freight locomotives operated in the United States are diesel-electric and use diesel for fuel, although some Class I companies are testing locomotive technology powered by liquefied natural gas (LNG). Freight cars are often designed specifically for the commodity to be carried (e.g., automobiles, lumber, coal, steel, intermodal containers, and liquid tank cars or grain hoppers). Freight rail cars in the United States are owned by various companies—shippers, leasing companies, financial institutions and, of course, railroads.

Freight locomotives generally cost in the range of $3 to $4 million each. The cost of freight cars is in the range of $50,000 to $100,000 each, depending on the car.

Financing and Leasing Freight Rolling Stock

In North America, rail freight cars and locomotives are generally easy to finance. Because freight rolling stock (both locomotives and freight cars) can be used on any North American rail system, it is considered fungible—if it must be repossessed, there is a large resale market providing underlying security to the equipment owner. This natural market security allows financing methods wherein the equipment is its own security, as in a mortgage instrument. This allows low-cost types of debt financing. For example, to finance rolling stock purchases, some railroads use equipment trust certificates, a type of bond issued by the railway to a financing entity (a bank). Equipment trust certificates are described in detail in Chapter 6.

Locomotive-Hauled Passenger Train (Amtrak)

Freight Train (CSX)

Diesel-electric locomotives (Metro North)

Electric multiple-unit (EMU) train (Australian OSCAR)

Source: Wikipedia (Various)

Figure 3-2. Examples of rolling stock.

Passenger Rail Rolling Stock

For passenger rail, rolling stock includes locomotives and passenger cars. The cost of passenger rail rolling stock can vary greatly, depending on their specifications. For example, bi-level cars with toilet facilities typically cost much more than a single-level coach with seats separated by a center aisle.

Some passenger trains do not use a locomotive but have electric traction motors distributed among passenger cars that can be coupled together in trains of various sizes and operated from one end of the train or the other. These trains that use an electrical power supply are called electric multiple unit trains (EMUs). Trains that use diesel engines to generate distributed traction power are called diesel multiple unit trains (DMUs). Many high-speed trains found worldwide are EMUs with traction motors distributed throughout the train. EMUs and DMUs are more specialized than locomotive-hauled passenger trains—with power supply, speed, and car size and shape often designed for a specific application.

Passenger train locomotives typically cost about $5 million each.[26] The cost of typical passenger cars generally ranges from $1 to $3 million each, depending on complexity. The cost of EMUs and DMUs vary but is generally between $2 million and $10 million per car. For example, the current Eurostar trainset is a 16-car EMU costing about $100 million.

[26] Passenger locomotives are usually more expensive than freight locomotives because they have head-end-power systems and more sophisticated train control systems, more safety and environmental equipment, and more stringent crash standards.

Financing Passenger Rolling Stock

Passenger cars are generally more specialized for the services to be provided. Partly because of this specialization, they are slightly more difficult to finance than freight cars. In the United States, such equipment is most often purchased by a public body and is rarely leased or rented for short terms. Private financing of public rolling stock is generally constrained by tax laws. Private financing, quite prevalent in the past, is no longer used except in the form of municipal bonds and similar instruments. Sometimes builders will finance passenger rolling stock, but public financing is almost always less expensive. Private passenger equipment (e.g., owned by private contractors who may be contracted to provide public passenger services) can be financed in the same way as freight equipment, but this is often more expensive because such stock is generally more specialized and less fungible in secondary markets.

3.3 Operating Expenditures (Opex)

Ongoing operations and maintenance are carried out to provide transport services safely and for using the infrastructure, rolling stock, and other facilities, for a prolonged period. Operating costs (opex) include labor costs, fuel costs, track access charges (as applicable), as well as any administrative or overhead cost associated with the rail service. Maintenance costs are the costs associated with keeping the rail infrastructure and rolling stock in a good state of repair. This may involve repairing or replacing track, bridges, and other infrastructure components, as well as routine periodic maintenance of the rolling stock and so forth.

Railroads are a very capital-intensive business. They can function for years with minimal new investment due to the long lifespan of railroad assets. However, although trains can continue to run without regular investment, costs rise for materials and maintenance, and service quality and asset values decline. A railroad that is not regularly investing is "eating" its assets. Over the longer term, the railroad becomes unsustainable.

Source: World Bank "Railway Reform Toolkit," 2011.

CHAPTER 4

Funding and Financing Rail Projects

4.1 Funding vs. Financing

The terms funding and financing are often confused or used interchangeably. They are in fact very different.

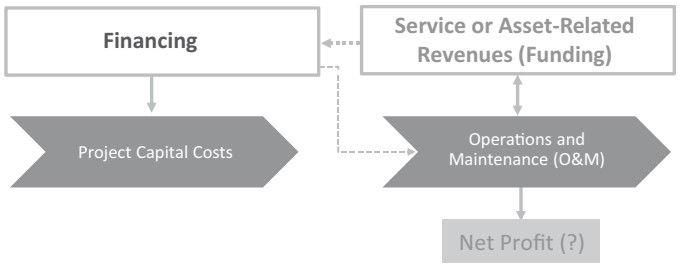
Funding refers to the sources of revenue that can be used to pay for a project or service. Sources of funding include but are not limited to future revenue streams from the delivery of rail transportations services (whether freight or passenger services), ancillary revenues, and non-repayable government grants and subsidies.

Financing refers to the financial mechanisms or tools used to access money to pay for a project or service—generally before the project generates the necessary revenue to pay for the investments. Financing mechanisms include various forms of debt, equity, and capital leases. Financing is typically used when a project's revenues do not correspond to the cash needs of the project. For instance, financing mechanisms can be used to raise capital needed for the construction phase of a project, before revenues associated with the project start to flow. The use of financing mechanisms generally creates an obligation to the entity providing the financing. This could include an obligation (debt) to pay the money back with interest or to provide an ownership stake (equity) in the investment and an associated share of profits.

As defined by the AASHTO Center for Excellence in Project Finance, **funding** mechanisms are the sources of revenue available to pay for investment in transportation assets or programs. **Financing** mechanisms are the financial tools or approaches used to leverage project revenues, accelerate project development, and match the costs and benefits of long-lived assets.[a]

[a]Adapted from the AASHTO Center for Excellence in Project Finance report: "The Forum on Funding and Financing Solutions for Surface Transportation in the Coming Decade: Conference Report," January 2011, page 9. http://www.transportation-finance.org/pdf/featured_documents/sep_30_report_final_2011_02_02.pdf (accessed February 1, 2014).

Figure 4-1 provides a simplified representation of the funding and financing for a typical commercial rail project. Revenues associated with the service or asset (funding) generally flow only once the project is built and in service. Because project capital costs are generally incurred before revenues start flowing, financing—in one form or another—is used to pay for upfront capital costs.



Source: CPCS

Figure 4-1. Simplified representation of rail project funding and financing.

When revenues (i.e., funding) associated with a project or service are expected to be sufficient to cover the overall costs of the project or service, financing is relatively easy and can be accessed through commercial financial markets. Simply, the service or asset-related revenues, once they start flowing, are used to cover the project costs, including financing costs.

Conversely, it is difficult to access financing when future revenue sources (funding) are not expected to be sufficient to cover the overall cost of a project or service (i.e., when a project has a funding gap).

4.2 Service or Asset-Related Revenues (Funding)

A rail project's costs will be recouped, in full or in part, largely from revenues from rail services or the assets of the railway. Typical service or asset-related revenue sources are described below.

4.2.1 Freight Rail Revenues

In the United States, freight railroads have broad freedom to set their own prices for transport services. Some railroads publish a "tariff" (similar to list prices for many products and services), but most transportation fees are negotiated with individual shippers taking into account the distance from an origin to a destination, type of commodity, volumes, frequency, and other characteristics of the service, specified in (generally confidential) contracts between the railroad and a shipper.

Generally, railroads set rates so that total revenues cover capital and operating costs and provide a positive return on capital (i.e., profit). Individual rates vary all the way from marginal cost (where the railroad company is already committed to operate and maintain the railroad network, but can make extra income from additional traffic) to multiples of marginal cost depending on demand and competition. Freight services can be provided on the basis of a "take-or-pay" contract whereby a shipper agrees to give the railroad a minimum level of cargo for shipment or pay the railroad even if they do not provide the cargo. This model provides railroads with some longer term revenues against which to secure financing for any investments that might be needed to provide the specified services. Freight railroads also earn revenue from ancillary freight rail services and surcharges (e.g., on fuel), on access provided to shippers or to other train companies operating over their tracks, and from the sale or lease of rights to use their property (e.g., air rights over rail infrastructure, access to railway rights of way for utilities and fiber-optics companies, and development rights to land and stations for things like office buildings and cell towers).

30 Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects

Class I freight railroads in the United States are generally able to cover operating and maintenance costs and provide for a net return on capital sufficient to justify continuing the business.

> Commercial pricing is a relatively recent development. From the late nineteenth century until the passage of the Staggers Act (1980), rail rates and many conditions of service were determined by an independent national authority (the Interstate Commerce Commission [ICC]). The ICC had the power to direct railroads to provide loss-making services for the public good and to set the prices for which all rail services would be delivered. Loss-making services had to be cross-subsidized by higher prices for other services. Often prices and services were not well matched to alternatives available in the marketplace. Government regulation came close to destroying the U.S. freight railroad industry, and by 1975 many railroads were actually in bankruptcy. Some short-line railroads still operate at a loss and require financial support in one form or another to remain viable.

4.2.2 Passenger Rail Revenues

Passenger railroad revenues largely consist of revenues from the sale of tickets. Different ridership revenue models can include different ticket prices based on type of ticket (e.g., economy vs. business class) and yield management models (e.g., higher prices at peak periods). Other revenue is also typically generated from the sale of food and drinks in stations and onboard trains, onboard advertising, parking commissions, station property rentals, and other sources, though these generally represent a small fraction of operating revenues.

In the United States, no passenger railroads cover their operating and capital costs, and passenger rail services must be supported by government.[27] On some corridors, passenger revenues may cover operating costs, but very rarely (if ever) do they cover all related infrastructure costs. Passenger railroad operators in the United States (Amtrak and the various commuter authorities and agencies) require funding support from federal, state and/or local funding agencies.

4.3 Financing as a Means of Bridging Timing of Costs and Revenues

Financing is relatively straightforward when a rail project's service or asset-related revenues are expected to be sufficient to cover costs and pay back the financing and associated financing costs. For such projects, there exists a range of financing products, available on commercial markets. Table 4-1 provides a high-level summary of the types of financing used for rail projects. The terms and cost of financing for each of these mechanisms can vary greatly, depending on the creditworthiness of the owner, project proponent, or service provider, and the extent to which the financing has recourse to assets that are fungible (i.e., can be resold).

[27] Operating financial performance for Amtrak's services varies widely. Acela services and Amtrak services on some other routes earn an operating profit, which is then used to subsidize other services. Some reforms to re-invest these operating profits into their respective services have been proposed. This could strengthen services with high financial performance but increase reliance on public funding sources for services with poor financial performance.

Table 4-1. Typical sources of private finance for rail projects.

Instrument	Description
Retained Earnings (Cash)	Cash available after operating expenses, debt service, taxes, and dividends to shareholders. Class I railroads pay for much of their investment programs from retained earnings
Equity	A financial investment representing an ownership share in the project. This could be in the form of publicly traded stocks or private equity. As an unsecured investment, the return on equity is highest, reflecting its inherent elevated risk.
Share issue	The public issue of equity through sales of shares in a company via a public stock market (e.g., NYSE).
Private equity	Private investment in ownership that is not publicly traded on a stock market
Debt	Debt, in one form or another, is often used to leverage an equity investment by a project proponent. Debt can be recourse (i.e., backed by collateral) or non-recourse (i.e., not backed by collateral).
Loans	Short or long-term commercial loans, typically with fixed interest payments
Bonds or debentures	Debt instruments issued in the capital markets, whereby bond issuer agrees to pay a fixed interest (coupon) rate to bondholders.
Equipment trust certificates	A debt instrument – similar to a mortgage or lease – where an investor is given use of a particular asset (e.g., rolling stock) which they pay for over time according to specifications of the debt agreement. In the US, equipment trust certificates are bonds issued by the railroad to a financing entity (a bank or pension fund). The certificate gives the bondholder the first right to the equipment if scheduled interest and principal are not paid when due.
Capital leasing	A long-term lease considered by accounting standards to be the economic equivalent of asset ownership. Typically most or all of the useful life of the asset is consumed during the lease and/or the asset is transferred to the lessee at the end of the arrangement.
Operations leases	A short-term lease for rolling stock, office space, or other assets. Typically, operating leases are usually limited to a term of 10 years but many operating leases are for shorter periods.
Lines of credit	A revolving line of credit typically for short or intermediate term financing.

Source: CPCS

Recourse to Assets and Rail Project Financing

One of the challenges railroads often face in raising private finance has to do with the relative attractiveness of fixed rail assets. The extent to which a private financier (e.g., a lender or a bank) can have (and would want) recourse to assets if a project fails is a material consideration. Fixed rail infrastructure (e.g., tracks, wayside equipment, and signals) are immoveable assets with a limited resale market, especially if the transportation services they support are loss making. Bridges, tunnels, and other fixed facilities usually have no potential for resale separate from rail infrastructure. Such facilities can be financed on the basis of

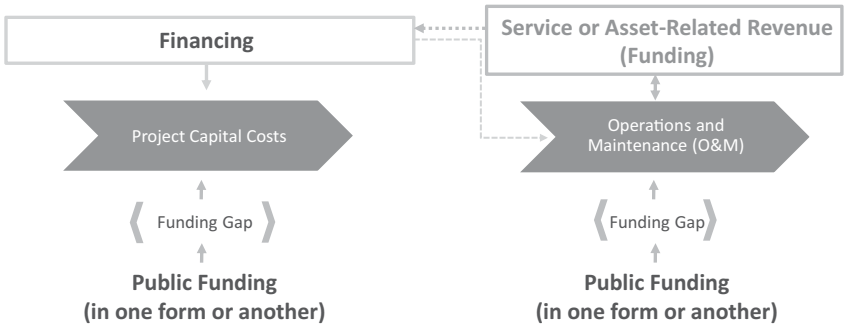
a revenue contract (e.g., a toll bridge). The cost of the financing will be a function of the financing capacity of the entity providing the revenue contract. Land is often the most valuable part of infrastructure assets. Railroads generally have extensive land holdings, some in very valuable urban areas, and others in suburban and more rural areas. Rights to the use of railway land are often used in project finance—air rights, development rights for warehousing and manufacturing facilities, and for many other purposes.

In contrast, freight rolling stock is much more easily privately financed because of the diverse resale market. New large locomotives are relatively standardized across freight rail systems. Similarly, freight cars are designed to work freely across all freight rail networks. This common design and cross-system use permits many different types of financing mechanisms—from outright purchase using typical debt instruments to long- and short-term leases and even to rental agreements—because the equipment can be easily moved between users. Thus, if a private financier exercises its recourse to the asset in the event of default, the financier can obtain immediate value from the asset in a resale market relatively easily. Depending on the design, there can also be a good resale or releasing market for passenger rolling stock.

4.4 How to Realize Rail Projects That Have a Funding Gap?

Financing is typically not available to projects or services that have a "funding gap." Indeed, a funding gap—when revenues are insufficient to cover the cost of a project or service—is a funding, rather than a financing, problem. Short of reducing a project's costs, there is but one solution to addressing a funding gap: finding other sources of revenue.

Specific mechanisms by which a rail project or service provider could increase revenues from its assets or services exist. Many of these asset or service-related mechanisms are described herein (see Chapter 6). When these mechanisms are insufficient, public funding support, in one form or another, is usually required to address a project or service funding gap, as summarized in Figure 4-2.



Source: CPCS

Figure 4-2. Simplified representation of rail project funding and financing dynamics when there is a funding gap.

Public funding is used when a rail project or service has a funding gap and that project or service is deemed to provide a net public benefit worthy of public investment. Public funding mechanisms generally include grants or other capital contributions (for capital investments) and/or operating subsidies (for operations and maintenance), although the form and terms of these grants and subsidies can differ. Unlike financing mechanisms, public funding generally does not need to be repaid.

Grants from federal, state, and/or local sources, often disbursed on the basis of a competitive, merit-based process, are one source of funding. Many grant funding programs are in place in the United States (see Appendixes A and B). For larger projects involving many parties, funding from multiple funding programs is sometimes used. Notable challenges associated with some grant funding (and other "subsidy" type programs) are that they can be subject to political uncertainty, with funding allocation based on unclear criteria (e.g., with no link to cost-benefit analysis relative to other projects). Public funding for rail projects can also become more complicated when rail projects cross jurisdictional boundaries and require shared funding from multiple jurisdictions.

Grant Programs for Freight Rail Projects

In the United States, the range of federal[a] and state grant programs for freight rail projects is largely intended to provide financial support to short lines to make capital improvements. Grants in some cases cover up to 100% of project capital costs (e.g., federal – Section 130 Railway-Highway Grade Crossing Program), but more often cover only a share of project costs (e.g., up to 90%). At the state level, grant programs vary widely and often focus on improving safety or separation of road/rail crossings and on broader economic development objectives.

[a] Eligible recipients of federal funding programs are almost always states, although in some cases municipal and transit agencies or private freight railroad companies are eligible for direct grant funding.

Subsidies to an operator to cover operating losses (which may include interest on debt-financed projects) are another funding source. Most passenger railroads receive government subsidies, in one form or another, to cover operating losses. Amtrak, for example, receives federal funding through appropriations from the federal budget on an annual basis to cover its operating loss and capital costs. With the introduction of Section 209 of the PRIIA of 2008, states also provide subsidies for short-distance Amtrak services within their state in accordance with an established cost method.[28] All commuter rail services are also subsidized from some combination of local, state, and federal sources.[29] Predictable and stable public funding (subsidies) for passenger rail services is needed to effectively plan and sustain these operations. Many public funding models, including federal appropriations for Amtrak, however, are neither predictable nor stable from one year to another. This creates a particular problem for planning and investment.

[28] PRIIA Section 209, Cost Methodology Policy, August 2011, http://www.highspeed-rail.org/Documents/PRIIA%20209%20Policy%20Final%20Version%20083111.pdf

[29] PRIIA (Section 209) requires that states must now pay operating and capital costs on a fully allocated basis for intercity rail service on Amtrak routes either state requested, on designated high-speed rail corridors (outside of the NEC), short-distance corridors, or on routes less than 750 miles.

CHAPTER 5

Key Considerations in Rail Funding and Financing Decisions

5.1 Public Benefits vs. Private (Financial) Return

Every rail project is unique, and so too are the financial dynamics and associated funding and financing needs. Nevertheless, principles can inform rail funding and financing decisions and the associated funding and financing mechanisms that can be used. Perhaps most significant among these is the project's intended purpose. The public and private sectors have very different motivations for undertaking rail projects. Generally speaking, the former is focused on enabling public benefits and minimizing negative externalities, while the latter is focused more strictly on private (financial) returns. Figure 5-1 helps illustrate this point.

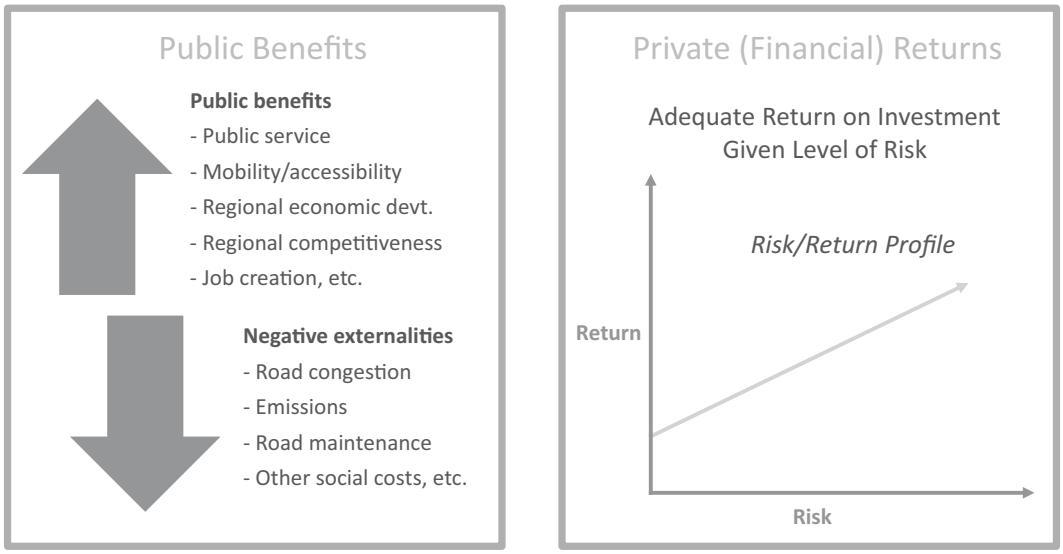
In considering the funding and financing needs of a particular rail project, a useful first question is the following:

Is the rail project and/or service driven primarily by a public benefit rationale, a private (financial) return rationale, or a combination of the two?

The extent to which a rail project is driven primarily by a public or private rationale will, in many respects, pre-define the project's funding and financing requirements and the associated motivations of those making financial contributions. For example, given that most passenger rail operations in the United States do not generate sufficient revenue to cover their operating costs, the public agencies that support these services make funding decisions based on an assessment of the public benefits these operations generate, as well as other considerations. Private freight railroads, on the other hand, make financing decisions based on the anticipated financial returns of a project given the estimated risk for a project and the company's financing capacity and overall strategy.

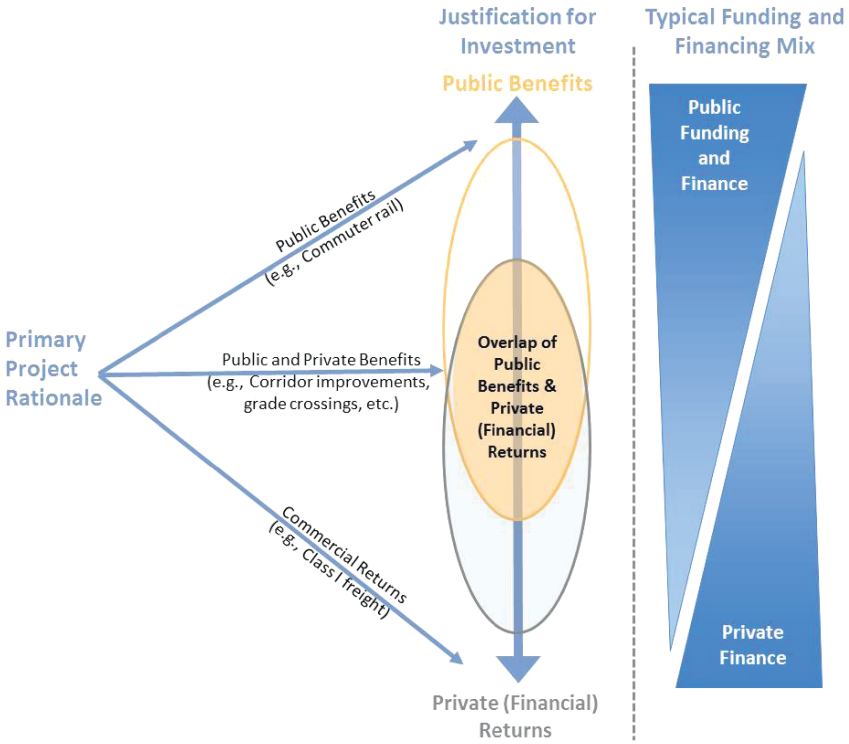
The public benefits vs. private (financial) returns rationale for a rail project can be summarized in a Public/Private Return on Investment Continuum, as represented by the vertical arrow in Figure 5-2. This provides a simplified depiction of what public vs. private sectors typically seek from their rail investments, as well as the associated typical mix of public funding vs. private finance along this continuum.

At one extreme, projects with a largely public rationale (e.g., commuter rail service) will be justified on the basis of whether or not the allocation of scarce public resources would yield sufficient public benefit to justify the investment (often assessed on the basis of benefit-cost analysis relative to other public investments of funding demands). At the other extreme of the continuum, projects with a wholly private (financial) rationale (e.g., most freight rail operations) will generally be justified on the basis of whether or not the allocation of private resources would yield sufficient return on investment (often assessed on the basis of financial rate of return relative to other investment opportunities).



Source: CPCS

Figure 5-1. Illustrative examples of public benefits vs. private (financial) returns.



Source: CPCS

Figure 5-2. Public vs. private return on investment continuum.

Private-Sector Rate of Return Expectations for Rail Projects

Generally, private rail entities look for project investments to generate returns of 15% or more and the cost of financing such projects is typically less than this. Class I railroads have a computed regulatory cost of capital[a] of about 11%. Private investors usually insist on a higher return than the cost of capital, because of the risk that the project costs will turn out to be higher or the returns less than expectations. Most U.S. Class I railroads have internal rate-of-return hurdle rates (the projected return on investment that a project must earn to be included in the railroad's discretionary investment program) in excess of 15 to 20%. When projects offer a lower return, they are typically deferred or cancelled in favor of other projects offering higher returns. In some cases, rail investments may not have an internal rate of return but are required to meet regulatory requirements to remain in business.

[a]The regulatory cost of capital is computed each year for U.S. Class I railroads using specified regulatory accounting standards. For 2010, the regulatory cost of capital was 11.03% and included an average cost of debt of 4.61% and an average cost of equity of 12.99% with an industry capital structure of 23.38% debt and 76.62% equity. This compares to a rate of return on net investment of 10.36% based on the same regulatory accounting standards. This difference indicates that, from a regulatory point of view, U.S. Class I railroads earn less on their investments than their cost of capital.

Funding and financing decisions become more complex when there is both a public and private rationale or interest for a project and related expected returns from the investment in question (overlap area along the Public-Private Return on Investment Continuum), but where neither public nor private sectors, on their own, can justify the investment strictly in terms of either public benefits or financial returns, respectively.

A shared passenger and freight corridor project is an example of a project with the potential for both public and private benefits. Another is a grade separation project, which will improve the fluidity of freight operations and minimize disruptions to road users simultaneously. Likewise, where projects may be paid for with a combination of public and private money (e.g., PPPs) there must be an appropriate balance of public and private risks and benefits.

5.2 Other Motivations and Interests in Funding and Financing Rail Projects

Other factors, beyond a strict consideration of public cost-benefit analysis or risk/return, contribute to rail financing decisions. Rail project financing is also driven by the institutional, commercial, and sometimes personal motivations and interests of project decisionmakers. These motivations and interests in turn influence if, how, and under what conditions a rail project proceeds, including whether or not it can be funded.

For a rail project or service to proceed and succeed, the motivations and interests of all key actors involved must be substantially satisfied. Table 5-1 provides a summary of key actors involved in or otherwise influencing the feasibility of financing rail projects generally, along with their respective motivations and interests.

Table 5-1. Summary of rail project actors and their primary motivations, interests, and funding/financing decision criteria.

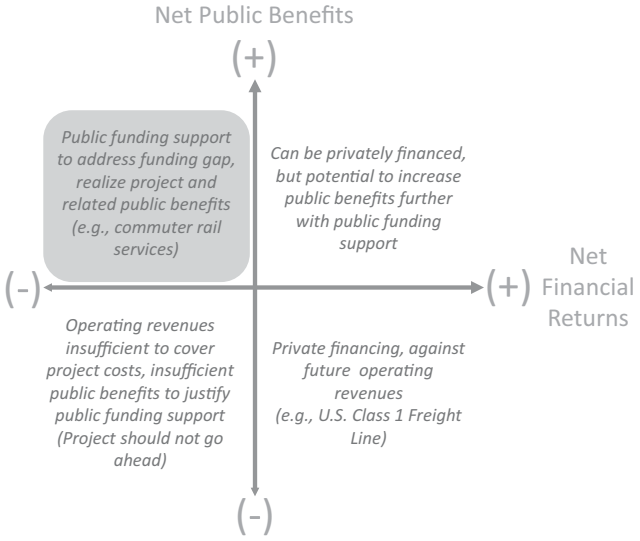
Key Decision-Makers	Driving Motivations/Interests	Rail Project Funding/Financing Decision Criteria
Public Sector		
Government ***Federal*** ***State*** ***Municipal/Regional***	• Maximizing public benefits (e.g., improved intercity rail) • Minimizing negative externalities (e.g., congestion and emissions) • The risk of project success/failure	Political level • Funding availability • Pricing policy • Public benefits (e.g., economic impacts) justify investment • Prioritization of project vs. alternatives • Project size/risk profile • Public support for project (votes) • Financing capacity and ability to attract grants, increase taxes
		Administrative level • Budget/funding availability • Necessary approvals (e.g., environmental assessment and procurement process) • Political constraints • Pricing and regulation policy
Public Railroad Companies (e.g., passenger operators)	• Achieving mandated public policy objectives	• Access to funding/level of support provided by public sources
Private Sector		
Private Railroad Companies (typically freight)	• Growth in profitability • Other strategic interests (network expansion)	• Return on investment (ROI) in line with company expectations • Investment risk profile (e.g., long-term revenue assured) • Financing capacity, access to finance/cost of capital • Shareholder support
Shareholders/capital markets	• Return on investment (share price, dividends)	Large institutional investor/shareholder • Consistency with investment strategy/ horizon • ROI in line with fund expectations • Relative attractiveness of alternative investment options
		Retail investors: Passive investors (limited direct influence)
Lenders/Banks/Bond market	• Return on loans	• Creditworthiness of borrower • Securing risks • Recourse to assets in event of default
Suppliers	• Business growth, profitability	• New/expanded business on which margins can be generated • Security of and risks associated with revenue stream • Assessment of project risks and risk profile of cash flows • Availability of alternative growth opportunities

5.3 Funding and Financing Strategies to Achieve Desired Outcomes

Notwithstanding the other considerations and motivations that drive rail project funding and financing, the extent to which a rail project or service is expected to have a net public benefit or a net private (financial) return is a useful basis for assessing funding and financing requirements. To illustrate, rail projects and services can be plotted on a simple two-by-two matrix, representing net public benefits on one axis, and private (financial) return on the other (see Figure 5-3). In Figure 5-3, "net" denotes whether the overall public benefits or financial returns for a project are positive or negative.

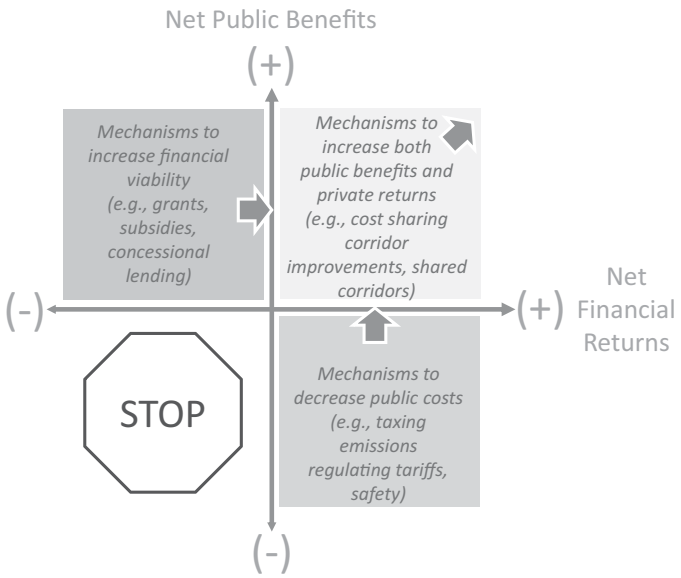
Rail projects or services falling into the bottom left quadrant, with neither a positive public benefit nor a positive private return, do not make any sense to undertake. Generally speaking, these projects should not be funded by the public sector (and will not be financed privately). Projects or services falling into the upper left quadrant could generate net public benefits, but require funding support to be financially viable and will not otherwise be financed. Projects or services falling into the bottom right quadrant, which provide a net private (financial), return are commercially viable and can be financed privately. These projects neither require nor warrant public funding given that their ends are private returns rather than public benefits. At the same time, the net public dis-benefits will need to be compensated for (through taxes or charges) to ensure that the public at least breaks even. Lastly, projects or services falling into the upper right quadrant could generate net public benefits and private (financial) returns. Such projects or services can be financed privately, but can also warrant public funding support or other intervention if such support could increase the net public benefits.

Figure 5-4 suggests a basis for the use of rail funding and financing mechanisms and provides insights into how certain funding and financing mechanisms could help shift rail projects or services from one quadrant to another to increase public benefits, a project or services financial viability, or both. This framework, though rudimentary, provides useful insights on what kind of alternative funding or financing mechanisms may be most appropriate given where a particular project or service falls in Figure 5-4.



Source: CPCS

Figure 5-3. Net public benefits vs. net private (financial) returns.



Source: CPCS

Figure 5-4. Use of funding and financing mechanisms to increase public benefits, financial viability, or both.

CHAPTER 6

Alternative Funding and Financing Mechanisms for Rail Projects and Services

The following discussion of alternative financing and revenue mechanisms is organized under three headings:

1. Service or Asset-Related Revenue (Funding) Mechanisms
2. Public Revenue (Funding) Mechanisms
3. Financing Mechanisms (Private and Public)

6.1 Service or Asset-Related Revenue (Funding) Mechanisms—Overview

Typical service or asset-related funding sources relate to revenues that can be generated from the rail project and/or its services. This most commonly includes transportation fees paid by shippers to freight railroads and fares paid by passengers to passenger rail service providers.

Other mechanisms that could be used to increase revenues from a rail project and/or the provision of rail service include those in Table 6-1. Table 6-1 indicates the type of rail project to which these mechanisms can be applied (passenger/freight), the type of cost that the mechanism can be used to fund (capital cost [capex]/operating costs [opex]) and, in a very general sense, the magnitude of the funding potential of each of these revenue mechanisms.

Criteria for Estimating "Funding Potential" ($, $$, $$$)

The research team developed a rough estimate of the funding potential of each alternate funding mechanism, where "potential" is a reflection of the extent to which the funds generated could be sufficient for financing capital projects by contributing to transportation revenue. As used in Tables 6-1 through 6-3, the criteria used in estimating funding potential are as follows:

- **Low** funding potential ($): funding sources that contribute less than 5% of transportation revenue
- **Medium** funding potential ($$): sources contributing from 5% to 20% of transportation revenue
- **High** funding potential ($$$): funding sources that can contribute more than 20% of revenue

These are necessarily estimates and the potential for any particular funding source depends on circumstances.

Table 6-1. Alternative service or asset-related revenue-generating (funding) mechanisms.

Service or Asset-Related Revenue-Generating Mechanisms	Freight	Passenger	Capex	Opex	Magnitude of Funding Potential ($=low, $$$=high)
Market Pricing to Maximize Fare Box Revenues (6.4.1)		✓	✓	✓	**$$** (potential to increase revenue ~ 10% to 20%)
Premium Services to Increase Service Revenues (6.4.2)		✓	✓	✓	**$-$$** (potential to increase revenue ~ 5% to 10%)
On-board and In-Station Retail Concessions (6.4.3)			✓	✓	**$** (potential to increase revenue ~3%)
Track Access Charges (6.4.4)	✓	✓	✓	✓	**$** (potential to recover marginal cost +)
Selling or Leasing Access to Railroad Rights of Way (6.4.5) (The operator and the owner may be different, which is often true of passenger operators. The benefits go to the owner.)	✓	✓		✓	**$-$$** (based in large part on the value of the land adjacent to the right-of-way corridor)
Commercial Property Development/Joint Development (6.4.6)	✓	✓	✓	✓	**$-$$** (extent of revenues depends on the size and type of the development)
Branding, Sponsorship, and Naming Rights (6.4.7)		✓	✓	✓	**$** (e.g., from $200,000 to $2m per year per rail station in major urban areas. Not often used in US context)

6.2 Public Revenue (Funding) Mechanisms—Overview

Public funding through grants or subsidies can help address a rail project or service's funding gap, as discussed in Section 4.4. Grants and subsidies are funding vehicles but the revenue used to pay for these funding vehicles must come from somewhere. Generally, the source of revenue for public funding for rail projects comes from some form of tax instrument (e.g., general taxes and fuel taxes). Other mechanisms used to increase public revenues for rail projects or services include those in Table 6-2. The magnitude of funding potential from public revenue mechanisms can be far greater than revenues generated solely from a rail asset or service—largely because these mechanisms can be applied more broadly and to a larger potential revenue base.

In addition to these alternative funding mechanisms, the public sector can raise general revenues in various ways [e.g., through lotteries and casinos and new taxes on things such as hydraulic fracturing (fracking) projects or fast foods]. It is beyond the scope of this research project to describe all the potential funding sources available to governments. For any revenue mechanism to be an effective and sustainable means of funding rail projects, the revenue stream should be dedicated, in whole or in part, to rail projects or, more broadly, transport projects.

6.3 Financing Mechanisms (Private and Public)—Overview

Financing mechanisms include debt, equity, and other financial tools. Financing can be obtained from the private and public sectors.

Private finance providers (e.g., commercial banks and investors such as pension funds, hedge funds, and equity investors) provide loans, equity, and other forms of financing in order to generate a commercial return. The cost of capital (i.e., the rate of return that an investor seeks

Table 6-2. Alternative public revenue (funding) mechanisms.

Public Revenue (Funding) Mechanisms	Freight	Passenger	Capex	Opex	Magnitude of Funding Potential ($=low, $$$=high)
Incremental Property Tax Revenues (for Tax Increment Financing) (6.5.1)	✓	✓	✓		**$$** (depends on the actual increase in property values generated by project; will vary considerably by case)
Special Assessment District (SAD) Fees (6.5.2)		✓	✓		**$$-$$$** (contribution varies depending on the overall capex requirements for the project and the benefits expected to be generated)
Impact Fees Charged to Property Developers (6.5.3)		✓	✓	✓	**$$** (highest in strong real estate markets)
Station Parking Charges (6.5.4)		✓	✓	✓	**$-$$** (potential to generate 5% to 10% in additional revenue)
Road Tolling/Congestion Charging (6.5.5)	✓	✓	✓	✓	**$$** (more typically used to fund transit but can be applied locally for joint road/rail facilities)
Heavy Goods Vehicle (Truck) Charges (6.5.6)	✓		✓	✓	**$$$** (depends on level of charges and amount of traffic – European examples in the $ billions)
Gas Tax (6.5.7)	✓	✓	✓	✓	**$$$** (total funding potential very large – in UK, £26 billion [$40 billion] each year, 1.7% of GDP)
Car Registration Plate Auction (6.5.8)		✓	✓	✓	**$$-$$$** (funding potential very large)
Motor Vehicle Registration Fees (6.5.9)		✓	✓	✓	**$$$** (in UK, £6 billion [$10 billion] each year from motor vehicle registration fees)
Vehicle Mileage-Based User Fee (6.5.10)	✓	✓	✓	✓	**$$$** (For example, a 1-cent per mile tax would yield about $30 billion/year in US, with a typical driver paying about $120 per year per vehicle.)
Payroll Taxes Used for Transport (6.5.11)		✓	✓	✓	**$$$** (depends on the extent of the program: geographic size of the taxation zone, tax rate, etc. In the Paris Region, generate about $4 billion per year)
Sales Tax (6.5.12)	✓	✓	✓	✓	**$$$** (total funding potential very large; sometimes a share of Sales Taxes is assigned to transport projects and can be used to improve rail and road improvement projects from a general fund)
Carbon Tax or Credits (Cap-and-Trade) (6.5.13)	✓	✓	✓	✓	**$$$** (in California alone, 1 cent/gallon would yield around $170 million/year and 20 cents/gallon would finance the entire proposed HSR program without any other sources). The currently planned cap-and-trade program may raise up to $5 billion annually.

in exchange for financing) is generally commensurate with the level of risk of a project. The riskier the project, the higher the cost of capital, and vice versa. When a project's revenues are not expected to cover project costs, or when this revenue is uncertain, private finance providers will generally not invest in the project or service in question. In some instances, private finance may be attracted to a project because of innovative design and use of alternative financing products that minimize the risk or cost of the project to the private sector (e.g., where the public sector takes on risks not in the control of the private sector), such as government-backed loan guarantees or PPPs.

Providers of public finance (e.g., state infrastructure banks and government loan programs) also seek to invest in projects that are commercially viable, and these financing products typically have features that make them more attractive (e.g., lower interest rates, longer term loans, and flexible repayment terms). This is sometimes referred to as "concessional" financing. The focus of these public finance providers is typically on financing projects that have some form of public benefit, but that cannot obtain private finance (at a reasonable cost) given perceived project risks and/or the long payback periods. Capitalizing public infrastructure banks or loan programs can be a major challenge, though this is a funding, rather than a financing, issue.

Concessional Financing

Concessional debt products are similar in structure to those issued by private banks (e.g., loans, loan guarantees, and lines of credit), but which typically have features that make them more attractive to borrowers (e.g., lower interest rates, longer-term loans, and flexible repayment terms).

- Low-interest loans and loan guarantee programs exist for rail projects, including freight rail projects. These are available exclusively for capital investments (not operating costs). At the federal level, an example is the RRIF Program, which extends direct federal loans and loan guarantees to finance development of railroad infrastructure with repayment periods of up to 35 years and interest rates the same or comparable to U.S. treasury rates. Another example is the Transportation Infrastructure Finance and Innovation Act (TIFIA), which provides loans, loan guarantees, and standby lines of credit, when not otherwise available through commercial markets.
- **Loan Guarantees:** When risks associated with an investment are perceived as high, a mechanism that can be used to attract private finance is a government-backed loan guarantee. In such cases, the guarantor (e.g., federal, state, or local government) promises to assume the debt obligation of a borrower if the borrower defaults on the loan. Government guarantees are not new—they were used to finance the first transcontinental railroad in the 1860s.

Railway projects are usually complex with multiple technologies (e.g., infrastructure may include bridges, signaling and train control systems, rail tracks, stations and other buildings, and locomotives and other rolling stock), multiple property owners (e.g., railroads, other easement holders such as public utilities, and others), several regulatory interests, and many different financing structures. In any financing relationship, better terms are generally available from financing institutions familiar with (1) the industry, (2) the type of financing structure proposed, and (3) dealing with financing arrangements of the size and type contemplated. The experience and knowledge of the financing institution can make a significant difference in the amount, cost, and term of any debt-financing product.

Alternative mechanisms that could be used to finance rail projects or services include those in Table 6-3. This is followed by more detailed description of each of the identified Service or Asset-Related Revenue (Funding) Mechanisms (Section 6.4), Public Revenue (Funding) Mechanisms (Section 6.5), and Financing Mechanisms (Section 6.6).

Table 6-3. Alternative financing mechanisms.

Financing Mechanisms	Freight	Passenger	Capex	Opex	Magnitude of Financing Potential and Cost
Public-Private Partnerships (PPPs) (6.6.1)	✓	✓	✓	✓	Can finance entire project if future revenue streams are sufficient and predictable.
Equipment Trust Certificates (available to private companies) (6.6.2)	✓		✓		Amounts available range from about $20 million to $200 million, with interest rates equivalent to a federal rate plus 2% to 5%.
Operating Lease Certificates (available to private and public companies) (6.6.3)	✓	✓	✓	✓	Could range from $1 million to billions, cost varies by asset: Market prices – annual lease usually 10% to 25% of new asset price per year.
Finance or Capital Leasing (private and public companies) (6.6.4)	✓	✓	✓	✓	Finance leases depend on the creditworthiness of the lessee and can be used to finance many different types of assets.
Bonds with Public-Sector Backing (6.6.5)		✓	✓		Could be significant. Cost typically 25%-30% below prime rate.
Corporate Bonds (available for private entities) (6.6.6)	✓		✓		$25 million to $1 billion+. Federal Rate +1% to +5%; interest taxable to recipients.
Mezzanine Financing (available to both private and public companies/authorities) (6.6.7)	✓	✓	✓	✓	$100s of millions for large railroads; $10 million-$100 million for smaller ones. Prime; prime +1%-5%.
Short-Term Corporate Line of Credit Financing (6.6.8)	✓		✓	✓	$20 million to $100 million. Prime rate to prime rate +5%; initiation charge.
Sale of Stock (Ownership Stake) (6.6.9)	✓	✓	✓	✓	$100s of millions for large railroads; $10 million-$100 million for smaller ones. Cost typically in range of 12% to 20%.
Tax/Investment Credits (6.6.10)	✓		✓		Varies significantly on a case-by-case basis and on state and federal tax codes.

6.4 Service or Asset-Related Revenue (Funding) Mechanisms

6.4.1 Market Pricing to Maximize Fare Box Revenues

Sector	Freight	Passenger
		✓
Type of cost	Capital Expenditure (Capex)	Operating Expenditure (Opex)
	✓	✓
Description	A major source of revenue for passenger railroads is ticket sale proceeds from passengers. Revenue collection is a function of ridership level and fare structure. Revenue maximization is often constrained by political acceptability (and in some other countries by regulation); even without this, it depends on railroads' ability to accurately predict elasticity of demand from passengers. Raise prices too high and passengers will use other modes; keep ticket prices low and operators may be missing an opportunity for higher revenues. Many transit operators have very simple fare structures, with a flat fare per trip, with discounts depending on status (e.g., seniors, students, and children), and	

	sometimes with free transfer between routes. These simple fare structures usually do not maximize either use of public transport or revenues. More complex fare structures exist which can generate additional income through more market-based pricing, while increasing ridership. Examples include "zone" or distance-based fares, higher peak fares, targeted discounts for off-peak travel, daily "capping" of total fares paid, integrated prices (fares) with other modes, and charging for related purchases (e.g., car parking).
Extent of funding potential	Compared with flat fare systems, market pricing is believed to increase both revenues and passenger volumes, each by 10% to 20%. Although plenty of anecdotal evidence supports this, as well as economic theory, this research team is not aware of any controlled study.
Implementation costs	Capital and operating costs of more complex fare systems depend on system characteristics, but conversion of modern fare collection systems using smartcard and/or smartphone technology can usually be offset entirely by staff and equipment cost savings and reduced revenue "leakage" with a payback within 2 or 3 years. Fare collections systems now can be acquired with a service-provider structure, with equipment and software all financed, installed, and maintained by a private contractor; and with payment entirely on a per-transaction basis, so no upfront capital expenditure is required by the transport system owner/operator.
Case study	Smartcard systems are common across large urban systems around the world, including the United States. An example from the United Kingdom is presented below. (1) Transport for London (TfL), UK TfL is the local government body responsible for the planning, delivery, and daily operation of London's public transport system, including buses, light rail, some overground (commuter) rail, and the underground subway system. In 2003, TfL introduced the Oyster Smart Card system, which can now be used across all of the transport modes. This means riders can travel by bus, subway, and commuter rail all using the same Oyster Card. TfL estimates that this system increased revenues by 10%-20%[30] and also increased ridership a similar amount. Oyster Card update was encouraged by dramatically raising fares not purchased using the Oyster Card (i.e., creating an incentive to purchase the Oyster Card). Before full integration with the Oyster Card, TfL already had a fare-by-distance system, with higher peak fares, and integration with most subway ("underground"), bus, and commuter rail services. Now, occasional transit users can now also travel using "wave and pay" credit cards on bus services and this is being extended to all services. Passengers can pay either for each trip, for a daily pass, or use an Oyster Card for "Pay as you Go" (PAYG) travel. Daily PAYG fares are capped (in effect offering a day pass) at different levels, depending on which modes are used, when trips are made, and which zones are entered. Oyster Card balances can be topped-up online or with "auto top up." TfL caps the Oyster Card at a low daily level, about $7.50, for a passenger who only uses the buses. For passengers who also use the subway or commuter rail system

[30] Based on discussions with Shashi Verma, Director of Customer Experience at Transport for London.

	(including commuter rail under central government jurisdiction), the card is capped at $10 to $25 per day, depending also on which zones are entered and whether the card is used in the morning peak period. Giving low-income travelers the ability to make multiple trips for a low daily maximum fare, but only on the buses, has helped make it acceptable to charge much higher fares to those who use the faster rail and subway network. Capping the bus-only fare at a relatively low level addresses concerns that transit is expensive, while allowing TfL to maximize revenues from rail and subway users and thereby raise money to pay for new investment. In 2000, TfL covered almost 100% of total operating costs from fares, including infrastructure maintenance and renewals. However, **a policy decision was made to increase transit services, so that fares now cover about 60% of total costs.** (2) London regional rail services These are mostly operated by private companies under franchise agreements. They set a minimum service frequency on each route, at each time of the day. They also set the maximum fares, which are usually the fares charged to peak hour travelers and the weekly commuter fare. However, virtually all London operators offer off-peak tickets at 40% to 50% below the full regulated fare. They do this for commercial reasons: the lower fares attract more off-peak travelers who might otherwise drive or not travel at all, and also divert some riders out of the crowded peaks, thereby reducing the need to buy new trains. Most operators also provide off-peak service in excess of the minimum requirements: routes that had two trains each hour through the day before privatization now often have three or four. About half of the London regional (commuter) services now operate with little or no subsidy, with fares covering all costs, including capital charges.
Enabling requirements for success	Legal: Most U.S. transit authorities already have freedom to set fares at any reasonable level, although some consider income redistribution with low fares to be a part of their policy mandate. There can be significant political pressure to keep fares low. Very few cities offer cheaper off-peak fares. Policymakers: Policymakers and operators must be willing to abandon the “flat fare” structure, which exists in many U.S. cities; it has been popular traditionally and is easily understood by administrators, users, and voters. Institutional capacity: In the case of multi-modal transit systems (e.g., bus, subway, and urban rail) with diverse operators, the operators must also be willing to cooperate and to determine reasonable joint fares and a workable basis for apportioning revenues between different operators. Just as airlines offer cheaper fares for connecting passengers than the simple sum of point-to-point fares, because these generate more traffic, it will usually make commercial sense to offer multi-operator fares that are less than the separate fares charged. Typically, revenues from joint fares are shared proportional to the distance traveled on each operator’s system, but sometimes there are adjustments to reflect higher costs, and a “flagfall” element to reward operators who provide a short but vital feeder or distributor mode. In some cases, these will be operators from different states. For example, passengers using the New Jersey PATCO commuter rail system, which runs into downtown Philadelphia, can use their "Freedom Pass" smartcard to

	purchase discount fares for connecting journeys on selected SEPTA bus and rail routes in downtown Philadelphia. In effect, this is a joint fare, although passengers need to purchase the connecting fares in Philadelphia using their PATCO smartcard. If both operators used compatible smartcards, a wider range of joint fares could be offered, extending onto the SEPTA suburban and commuter rail routes. Workforce: Staff must be willing to accept changes in working practices. In some cases, traditional jobs will be eliminated or radically changed. For example, staff who have previously spent the day inside a ticket booth may be redeployed helping passengers on station platforms. Public Acceptance: Transit users need to be persuaded that the changes to fare structures will, overall, be of benefit. On average, passengers will pay the same or potentially less and all will find it easier to travel due to convenience of fare-paying options. Some peak passengers may need to pay more, but will benefit from less crowded services and will be able to pay less by changing their travel times.
U.S. application	Several U.S. cities have introduced smartcard-based fare collection systems, and some have moved part way toward market pricing. For example, Washington, DC, has a multi-mode fare collection system, with zones, peak pricing, and discounted transfer onto connecting buses. However it is not integrated with commuter rail. San Francisco BART has always had a distance-based fare structure and has introduced a smartcard, which gives a small discount (25 cents or 12.5% on the $2 single fare) for passengers transferring between BART and the Muni Metro light rail system. However, fares do not seem to bear much relation to market demand. Arguably, BART should be able to charge the highest fares to passengers traveling directly to downtown San Francisco, where roads are most congested and parking most expensive. To maximize revenues, it should charge less to passengers traveling to other locations, requiring a transfer onto the Muni Metro.[31] The Boston Metropolitan Transportation Authority (MTA) Charliecard is valid on bus, subway, light rail, and commuter rail. New York MTA Subway has integrated fares with city buses, but no integration with commuter rail, or with New Jersey transit bus, rail or subway services. Passengers traveling from, say, Newark Airport to Connecticut may actually need to purchase three or four separate tickets. NJ Transit and NY MTA could almost certainly attract more riders and increase their revenues if they operated a single integrated fare system with market pricing. Although somewhat distinct from the market pricing debate, another means to raise direct revenues from passenger ticket sales for transport investment is to add an explicit additional charge to tickets sold to passengers, with funds dedicated to a specific transportation account (e.g., “Central Station Improvement Fee”). This approach is common in the air sector, where charges added to tickets for each enplaned passenger are returned to the airport (typically between $1 and $4.50). Of course, if fares are set using market methods, then adding a “surcharge” is effectively a zero-sum game.

[31] See Ruth Miller and Matthew Schabas “Sketch modeling alternative fare structures: Can BART do better?” paper presented at TRB Annual conference 2013, available at: http://assets.conferencespot.org/fileserver/file/42589/filename/39dunf.pdf

6.4.2 Premium Services to Increase Service Revenues

Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
	✓	✓
Description	One means of raising ticket revenues is to charge higher fares for higher standards of service on public transport (e.g., First Class or express trains).	
Extent of funding potential	Premium fares might generate higher revenues, but may also impose higher operating costs. The benefit will be greater if premium services attract passengers who would not otherwise use public transportation (e.g., attracting business travelers on the Amtrak NEC who would otherwise drive or fly). The net effect of offering First Class on commuter rail might be a 5% to 10% increase in revenues. No definitive research exists because no operators are prepared to forego revenue in order to conduct a controlled study.	
Implementation costs	The implementation costs for providing a higher standard service depend very much on the application and strategy.	
Case study	UK Rail Many UK rail operators, including commuter rail operators, offer First Class services. Commuters benefit from a higher standard of seating and a better chance of getting a seat, although there is no guarantee of a seat. Dubai Metro The Dubai Metro offers a "Gold Class" with one car at the end of each train reserved for passengers paying a higher fare and benefiting from higher standards of seating, and (usually) less crowding. The Gold Class car has an onboard attendant who stands at the door and checks fares on boarding. A seat is not guaranteed; however, the Gold Class car is usually less crowded.	
Enabling requirements for success	Implementing a higher standard option is a policy decision for the transport operator. This decision needs to be made based on the financial benefit evaluated on a case-by-case basis. Services that provide more space are not suitable if there is limited capacity.	
U.S. application	Most U.S. airlines and Amtrak offer a higher standard of comfort and service for a higher fare, usually in a designated First Class or Business Class. Several transit operators have higher fare express bus services, in effect a premium service but not on the same vehicle. However, we are not aware of any U.S. commuter rail or metro operator that operates a multi-class service.	

6.4.3 Onboard and In-Station Retail Concessions

Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
		✓
Description	Transport operators can raise additional non-ticket revenues from sales of other products and services both onboard trains and at stations. Examples include selling refreshments on board, selling access to Wi-Fi, and retail shopping opportunities.	
Extent of funding potential	Onboard concessions sales typically do not make up a large portion of overall operating revenues, although revenues depend on the services offered and the innovation in products. In 2012, approximately 5% of Amtrak's passenger-related revenues were from the sale of food and beverages.[32] Additional costs can be associated with providing such services (e.g., if an additional person is needed to handle sales on board a train), which need to be balanced against potential revenues. In some countries, the transit authority sells a concession for onboard services.	
Implementation costs	The implementation costs for providing a higher standard service depend very much on the application and strategy.	
Case study	VIA Rail, Canada's intercity passenger rail operator, offers a paid food and beverage service on most of its routes, with quality and price depending on the route and level of service. The company also now offers free Wi-Fi on its primary corridor service between Windsor and Québec City (passing through Toronto and Montreal), as well as the long-distance Montreal-Halifax service (in select cars). While not a source of additional revenues, the addition of complimentary onboard Wi-Fi is an added attraction for travelers, particularly considering other options where free Wi-Fi is not available throughout the journey (driving, bus, rail travel) and so may generate revenue indirectly. In November 2013, Swiss Railway Company SBB partnered with Starbucks Coffee to introduce a coffee and retail shop fully on board a train. The coffee shop is set up in a double-decker train car that has been made to look like a regular Starbucks shop, with a coffee-inspired color scheme, contemporary design elements and seating arrangements like that of a regular Starbucks. The shop seats a total of 50 people. The outside of the railcar is branded with Starbucks logos and graphics. In terms of in-station retail concessions, these already exist in many stations across the United States, including in Chicago and Philadelphia, where Amtrak owns the buildings and receives rent from retail tenants. In the public transport sector, airports provide a leading model of this potential. Airports in the United States have evolved over the last 40 years from playing an exclusive transport role to include retail services and complete property development solutions, including hotels, shopping amenities and industrial business parks. This form of revenue diversification has become an integral part of airport finance. Some railroad stations in Europe (e.g., St. Pancras in London) have similar schemes.	
Enabling requirements for success	Policymakers and operators need to be willing to adopt a commercial mindset and approach to identifying services travelers are willing to pay (or pay a premium) for.	
U.S. application	We are not aware of any legal or other restrictions on opportunities for increased revenue generation on board U.S. railroad experiences and such services already exist in some places.	

[32] Amtrak Annual Report 2012.

6.4.4 Track Access Charges

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
	✓	✓
Description	Rail tracks can have multiple operations in one of two ways: a host railroad owns the infrastructure and operates its own trains, but allows other operators limited access for a fee; or the infrastructure is owned and managed independently and all operators pay a fee. The host railroad can be either a freight operator or a passenger operator, and the tenant operators can be passenger or freight as well. The common U.S. model ("trackage rights") has been freight-on-freight with fees mutually negotiated, though trackage rights have also been ordered by the STB in the case of freight rail mergers.	
Extent of funding potential	The objective of track access charges is to support an efficient method for multiple uses of the same tracks: this can lower cost (for complementary users such as passenger and freight) and promote competition in freight versus freight or passenger versus passenger services. Depending on the level and structure of the charges, it can generate net income for the owner, but that is not generally the purpose. In Europe, the basic objective is only to recover at least marginal costs from users, with public funding providing funding for most fixed costs. Some EU infrastructure owners attempt to recover a portion of fixed costs from operators, but none recover full costs. Some eastern EU countries attempt to set freight access charges high enough to permit lower passenger access charges, but this raises rail freight costs and thus makes rail freight less competitive.	
Implementation costs	Raising track access charges in the U.S. context would require sophisticated costing systems that might be expensive. However these costs would be offset by ensuring the costs of providing infrastructure capacity are fully taken into account by the operator. Class I freight railroads in the United States have sophisticated costing systems and access charges are generally set to recover incremental cost and a portion of fixed costs.	
Case study	Measured by the length of its system, Amtrak is the world's largest tenant passenger operator on freight infrastructure. Amtrak's access rights were fixed by law, and it is supposed to pay "avoidable cost" to the freight railroads hosting its trains. In practice, the access charges are negotiated separately for each railroad and are kept confidential for commercial reasons: Amtrak's access charges paid to freight railroads total over $100 million annually, an average of around $3.50/train-mile. In addition, Amtrak pays additional charges if it needs extra capacity or a higher operating speed than the freight railroad would otherwise provide. Some U.S. commuter railroads operate at least parts of their system over freight tracks and pay for these access rights. VIA in Canada has a similar approach to that of Amtrak, except that the basic access rights and standards for the charges imposed in the United States (variable costs) were not specified in Canada, and there is no regulatory authority in Canada that can intervene on VIA's behalf to ensure that VIA's access charges or access priority are reasonable.	

	By comparison, EU railways have separated their operations (i.e., commuters, conventional intercity passengers, high-speed passengers, and freight) from the infrastructure providers. In this jurisdiction, the infrastructure providers are required to be independent in their decision making from any operator, with all operators (freight and passenger) paying access charges. Access charges are supposed to cover at least marginal costs (maintenance, energy) but are permitted to recover some, or all, of the fixed charges as well. EU access charges can be different: on the same line for different types of service, on different lines according to allowable speed, and by time of day. The charges can include a component that varies by traffic volume (usually gross ton-km and/or train-km) and sometimes a fixed component charged in advance per scheduled train slot. Each EU infrastructure owner sets its own access charge regime (the approach must be approved by the national regulator), so the various national access charge regimes can be quite different. The access regime cannot discriminate either in access rights or charging structure as between operators.
Enabling requirements for success	The fundamental right of access for operators must be clear and non-discriminatory. In the U.S. freight system, where the financial profitability of each rail shipment is based on discriminatory pricing, there is continuing tension between the owning railroad and tenants as to the competition achieved and the loss of the ability of the owner to recover fixed costs. The second requirement for successful track access regimes is development of a transparent charging regime that, on the one hand, reaches the right balance between the financial goals of the infrastructure owner (recovery of marginal cost at a minimum plus some targeted share of fixed costs not otherwise paid by government) and, on the other hand, sending the right price signals to users in order to encourage efficient equipment choice and train scheduling. When access prices are too low, for example, operators run too many trains, especially when there is a shortage of capacity. If charges are based solely on train-miles, operators will run trains that may be too long and heavy (this is exaggerated if charges are per train-passenger). If there is a large fixed charge, such as advance charges per train slot, smaller potential competitors may be pushed out by large operators.
U.S. application	The basic non-discriminatory access system under which Amtrak gains access to freight railroads by paying avoidable costs was developed in 1971 when U.S. freight railroads had a lot of spare capacity. Since then, however, traffic density on the U.S. freight network has quadrupled and the variable cost of Amtrak's use of capacity is a legitimate issue. In addition, only Amtrak has a legislated right to access on freight tracks; commuter railroads and new operators do not. So while Amtrak faces increasing charges, potential new operators may not be able to gain access at all (or not at any acceptable price). The net revenue generated by a loaded freight train-mile is many times (at least 20) larger than the access charge for a passenger train-mile, and passenger trains actually consume more capacity than freight trains because of the speed disparity. This dilemma is partly mirrored in the Northeast Corridor, where Amtrak charges commuter trains and freight trains for access. The commuter charges were set by law

	at avoidable cost, which ignores the heavy impact of commuter trains on system capacity, especially in and out of New York City at rush hours. By comparison, Amtrak has set extremely high charges for freight, partly because some freight customers can only be served from NEC tracks and partly because heavy freight traffic imposes higher costs on higher speed passenger tracks. Because most U.S. rail trackage is freight dominant (99% of traffic is freight), the United States is likely to continue a system of owner/tenant trackage rights (mainly for freight) and access charges (mainly for passengers), although increasing congestion on the network is likely to put more pressure on access charges for Amtrak, and it is likely to further aggravate the reluctance of the freight railroads to allow access by new competitors. Because all of the passenger operators are supported by public funding, improved access to freight-owned tracks is likely to come only at public expense. One alternative example can be found in California (LA to San Diego and San Francisco to San Jose) where public authorities have bought old freight infrastructure to ensure passenger access on reasonable terms; in these cases, the original freight owner retained access rights for a stated amount of freight service with access charges and maintenance responsibility the result of negotiation. Freight railroads can sometimes be incentivized to accommodate passenger trains through an on-time performance regime. Such incentive plans mean monetary rewards or penalties when interaction with freight affects the on-time performance of passenger services. Many of the shared commuter rail corridors in North America use some type of incentive plan, including Capital Corridor intercity train service in Northern California, Metrolink in Southern California, and METRA in Chicago. Such incentive systems can be highly complex, however, because the specific cause of and responsibility for any delay (or part thereof) is not always clear. In any case, optimizing the use of privately owned infrastructure from a public interest perspective effectively requires that the private infrastructure owners are appropriately financially compensated for any adverse effects on their business.

6.4.5 Selling or Leasing Access to Railroad Rights of Way

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
		✓
Description	Railroad companies typically own the rights of way along their rail corridors that accommodate their trackage as well as excess land alongside tracks that can be used for such things as maintenance access, for safety reasons, or simply set aside for future expansion of existing railroad lines. All railroads generate additional revenues by leasing or providing easements to users who wish to have access to their right-of-way corridor. The most well-known examples are public utility companies, wireless technology companies, and pipeline and fiber-optic companies. In many instances, more than one external company is using a railroad's right of way at any given time (e.g., a parking lot, pipeline, and fiber-optic cable in the same space).	

Extent of funding potential	The extent of funding potential for railroads depends in large part on the value of the land adjacent to the right-of-way corridor and on the size and density of the population centers it serves. Historically (over 100 years ago), most easements were negotiated between railroads and public utility companies. Typical easements resembled leases with relatively low annual payments, with a periodic adjustment (every 5 years or so) based on mutual agreement. As land became scarcer and land values increased in the United States in the 1980s, the rent model changed and became much more formalized. In particular, railroads realized the value of providing access to a fully connected, "pre-assembled" corridor, usually directly into developed urban areas. Appraisers now recommend rents that consider the value of adjacent land to the right of way.[33] Over the past 20 years, the sale of access to railroad rights of way has increased dramatically, particularly for public utilities, fiber-optics enterprises, and land for cell towers and related facilities.[34]
Implementation costs	The implementation costs of charging third-party users for rights-of-way access are relatively low.
Case study	Leasing arrangements for use of rights of way along rail infrastructure are common across the world and the United States. For example, all U.S. Class I railroads have multiple agreements for fiber-optic lines. Similarly, Amtrak has leasing agreements with fiber-optic and telecommunications companies along its properties in the Northeast Corridor.
Enabling requirements for success	The owner of the right of way and the user must be able and willing to agree on a reasonable price and conditions for access to the right of way.
U.S. application	The granting, leasing, or renting of easement for rights of way in the United States is common practice among railroad companies. http://www.shenehon.com/staff/john-t-schmick-2/

6.4.6 Commercial Property Development/Joint Development

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
	✓	✓
Description	Commercial property development refers to the development of land or other property with the objective of obtaining some form of commercial revenues from the development. Amtrak has a history of generating revenues through real estate development on land that it owns, primarily along the NEC and the NEC station areas. Generally, it has limited its participation in real estate ventures to providing land use rights in joint ventures where the private partner does the development and manages the facility. A good example is the Union Station Redevelopment Corporation.	

[33] Schmick, J. and Robert Strachota, "Appraising Public Utility Easements, Part I and Part II," Railroad Right of Way magazine, January/February 2006 (Part I) and March/April 2006 (Part I).

[34] Most major railroads had substantial internal telephone systems to manage their operations. Sprint Telecommunications grew in part out of the efforts of Southern Pacific Railroad to commercialize its internal telecommunications network consisting of fiber-optic lines, microwave backbone services, and digital switches and PBX's in two major cities. The name SPRINT derives from Southern Pacific Railroad Internal Networking Telephony, a name given to the unit prior to its sale. SP bundled its telecoms assets and the rights to use its rights of way into a joint venture with GTE which eventually became Sprint Communications.

	Major freight railroads have industrial development departments that accumulate and manage land that might be used by customers. For example, many auto factories are built on railway-provided land. Many buildings have been constructed on railroad (or transit authority) owned land or above urban rail facilities. For example, many of the buildings in Chicago's famous loop are built on air rights purchased or leased from railroad owners. Joint development is a form of commercial property development, which involves a partnership between a public entity and a private developer to develop certain assets.[35] In some cases, the public agency may own the asset and solicit the involvement of a private-sector partner in its development. In other instances, a private enterprise in possession of an asset (e.g., parcel of land) may seek to partner with a public agency or a land developer to improve the asset through addition of commercial development structures (office buildings), transportation infrastructure, or related services (e.g., parking, shopping, equipment storage & warehousing). Various options exist for partnering arrangements. Revenue-sharing arrangements include • Leases (air right, ground leases, and subterranean leases) whereby the owner leases land or space to a developer • Sale of land to a developer • Station-Connection fees where the private sector pays the public agency for a connection between the transit facility and their private property Cost-sharing tools include • Incentive-based agreements where the public agency grants special development privileges (e.g., density bonuses) in return for a fee used to fund transport infrastructure • Voluntary agreements to coordinate and fund planning, construction, or operations around the investment areas that will benefit both parties • Equity participation, where both the transit agency and private developer contribute funds (e.g., construction of passenger rail facilities where real estate developers contribute to costs as transport services will increase value of their real estate developments).[36] In addition to revenue and cost sharing, joint development can benefit transit agencies through increased transit ridership, increased station-area density, and adding destinations on transit lines, both of which increase farebox revenues.
Extent of funding potential	Revenues from joint-development projects can be a good source of income for local authorities, although they are not typically a significant proportion of overall operating budgets. Revenue yields from joint development vary widely, ranging from tens of millions of dollars to a few hundred thousand dollars annually. The extent of revenues depends on the location, size, and type of the development, as well as the negotiations/structuring of lease revenue agreements between public and private parties.
Implementation costs	Transit authorities engaging in joint development projects need significant capacity (either in-house or outsourced) to conceive, plan, and negotiate these relatively complex partnership agreements. Building such capacity can be costly and takes time. Once partnerships have been established and operations have started, the costs to oversee lease arrangements should be minimal.

[35] See also: Mineta Transportation Institute, "A Decision-Support Framework for using Value Capture to Fund Public Transit: Lessons from Project Specific Analyses," MTI Report 11-14, May 2012.

[36] For example, land developers contributed several hundred million pounds to the development of the Docklands Light Rail service and the Jubilee underground line extension in London, UK, both serving Docklands, a developing part of London.

Case study	The Washington Metropolitan Area Transit Authority (WMATA) has completed over 30 joint-development projects since the 1970s, in part through their successful creation of a real estate development department that actively seeks out joint-development opportunities. **Bethesda Metro Joint Development (BMJD)** One project example is the BMJD, a development located above the Bethesda Metrorail subway station in Maryland close to Washington, DC. The BMJD sits atop the station and contains a 17-story office tower with office space, retail space, a 390-room hotel, and a five-story parking garage. The BMJD is owned and operated by the private Meridian Group, which leases land and air rights from WMATA for a minimum annual rent of $1.6 million. The partnership not only generates revenues for WMATA, but also provides WMATA with some opportunities to share construction and operating costs around the station. In this joint development case (though not in all cases), WMATA also shares in BMJD revenues when gross revenue exceeds $31 million. **Union Station Redevelopment Corporation (Amtrak)** By the 1970s, Union Station in Washington, DC, had deteriorated into a poor condition, in large part because of relatively low rail traffic levels. In 1981, Congress approved $8.1 million in funding as part of the Union Station Redevelopment Act, and in 1982 the Union Station Redevelopment Corporation (USRC) was created with the mission of restoring Union Station and developing it into an intermodal transportation center. Funding for the initial renovation came from Amtrak ($70 million), the District of Columbia ($40 million), and private developers ($40 million). The USRC oversaw the station's restoration and renaissance and Amtrak's corporate headquarters buildings, and as a retail/entertainment center that has become an economic generator for the city of Washington. USRC is a privately owned, non-profit corporation that now receives no federal funds and generates revenue through the operation of the parking garage and management of the developer's lease. Source: Union Station Redevelopment Corporation website www.usrdc.com **Hudson Bergen Light Rail Line** The diagram at right, prepared by the Jersey City Economic Development Corporation, shows the new office and residential construction underway in Jersey City associated with the construction of the Hudson Bergen Light Rail line. The light rail line was "one of the driving forces behind the booming development of office and residential space up and down the Hudson County coastline" according to the New Jersey Department of Labor (January 2001). 
Enabling requirements for success	Legal A primary barrier to greater use of joint development is when public agencies are prohibited from participating in property development, which is the case in several states and counties across the United States. With no control over the type and intensity of development around the transit station, these agencies cannot work with developers to attract investment and ideas.

	Capacity and Institutional Challenges Transit agencies also need specific skills to work with and negotiate with private-sector developers and the real estate development process. The public sector usually has an information deficit compared to developers. In the same vein, private developers are not always experienced working in partnership with public agencies and may perceive the risks of joint-development opportunities as too high (e.g., risks of competitive bidding process, high regulations, and "social" expectations from development outcomes). From a jurisdictional perspective, joint development can require that multiple public agencies agree on the approach to take (and who will have control) with respect to private-sector development, which is not always straightforward. For example, disagreements may take place between the local community/municipality and the regional transit agency.
U.S. application	Joint development projects have occurred in urban areas across the United States, including New York; Georgia; California; and Washington, DC. Such developments began in the 1980s and a GAO study reported 166 projects in place in 2010.[37] Such projects are most commonly associated with transit stations and Transit-Oriented Development (TOD), though they have been used for intercity passenger rail stations (e.g., Amtrak's Union Station Redevelopment in Washington, DC, and its 30th Street Station in Pennsylvania). The primary barrier to greater use of joint development is explicit or implicit prohibition of public agencies engaging in property development activities.

6.4.7 Branding, Sponsorship, and Naming Rights

Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
	✓	✓
Description	Transport operators may "brand" their product, facility, or service with the name of a commercial enterprise in exchange for regular payments from the enterprise. Examples include naming a train station after a corporate enterprise.	
Extent of funding potential	The extent of funding potential is limited, depending on the location and number of anticipated viewers of the branding (e.g., number of passengers who will pass through the station platform). In very approximate terms, funding can range from $200,000 to $2m per year per rail station.	
Implementation costs	Marketing and legal costs are associated with arranging for branding of stations, although these would be relatively small – on the order of 5% of the proceeds. However, there may be costs of several hundred thousand dollars or more to change names of existing stations on all maps and signs through a large system.	
Case study	**Dubai** has shown the potential to sell "naming rights" to stations in the Dubai Metro. Several stations have been branded, usually with the name of an adjacent development (e.g., a large shopping mall). The Dubai Land Transport Authority (LTA) is understood to charge about $2m per year, per station. Altogether, the LTA gets 30% or more of its revenue from naming rights and advertising. The LTA has been willing to play "hardball" to extract the branding fee. For example, the station at BurJuman junction was going to be given a different name, until the owner of the adjacent shopping center, also called BurJuman, agreed to pay for sponsorship.	

[37] United States Government Accountability Office. "Public Transportation: Federal Role in Value Capture Strategies for Transit Is Limited, but Additional Guidance Could Help Clarify Policies." GAO-10-781, 2010.

	TfL sold naming and branding rights for its cycle rental (bikeshare) system to Barclays Bank and for the cross-river cable car to Emirates Airlines. The "Emirates Air Line" is now shown on most official TfL maps. The Barclays Cycle Hire scheme is always referred to as such by TfL officials. Bicycles and docking stations are colored in Barclays' blue and there is extensive and highly visible branding. Similar bikeshare schemes are being supported by major banks in New York, Washington, and Chicago, in return for advertising on bikes and bike stands. The **New York MTA** renamed Atlantic Avenue station in Brooklyn as "Atlantic Avenue-Barclays Center." The MTA sold the naming rights to Forest City Ratner Companies, which is redeveloping the area, for $200,000 per year. Forest City then sold the rights on, together with the naming rights for the basketball arena, for $400 million or about $20m per year.
Enabling requirements for success	Legal: There do not seem to be significant legal issues associated with branding of public facilities. Institutional: Transit operators must be commercially astute and willing to accept changes to station names. Policy and Public Acceptance: Some stakeholders may object "in principle" to the commercial naming of facilities built and operated with public funds. However, branding and naming rights are commonly sold in the United States to raise revenue for facilities such as sports arenas that are usually built at least partly with public funds.
U.S. application	This funding source is not often used in the U.S. context. Transit authorities have been reluctant to use branding extensively. One reason given is a concern that changing station names will confuse passengers.[38] Obviously this greatly limits the potential for sale of naming rights, as most stations are already built and have recognized names associated with local landmarks. There seems to be considerable potential to increase revenue from this area, particularly for new stations.

6.5 Public Revenue (Funding) Mechanisms

6.5.1 Incremental Property Tax Revenues (for Tax Increment Financing)

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
	✓	
Description	Tax Increment Financing (TIF) is a method of value-capture financing used especially for new or redeveloped infrastructure areas where the value of the property around the new infrastructure is expected to generate increased revenues for a public authority through higher property tax receipts.[39] An example would be to finance development of a new passenger commuter rail station next to a housing development.	

[38] A New York MTA draft policy states: "Station names should be accurate and help orient customers as they navigate the MTA network. Recognizing the importance of ensuring that customers are able to navigate the system easily, requests for the Re-naming of a Facility will only be accepted from Sponsors with a unique or iconic geographic, historic or other connection to such Facility that would readily be apparent to typical MTA customers. An example would be a stop associated with a particular destination such that the vast majority of customers exiting at such station are headed to that destination. MTA will not consider Re-naming requests from third parties looking merely to brand a Facility in the absence of such a compelling nexus between the Facility and the Sponsor" (Metropolitan Transit Authority July 22, 2013).

[39] This summary draws heavily on the following report: Shishir Mathur and Adam Smith, "A Decision-Support Framework for Using Value Capture to Fund Public Transit: Lessons from Project-Specific Analysis," May 2012. Mineta Transportation Institute MTI Report 11-14.

	TIF is implemented by creating a geographic district administered by a TIF authority, usually a redevelopment agency. After the district is created, the assessed property value for properties in the area is frozen for a period of time, usually 10–25 years. As new public funds are invested (e.g., new retail, new train/bus stations), the property values increase and so do the property tax revenues. The incremental tax revenue (new property taxes less frozen property taxes) is diverted to the TIF authority rather than the agencies that would normally receive it (e.g., local municipality). Funds can be raised using a "pay-as-you-go" method, by spending incremental tax funds only as they are collected. This can be a slow process because development is financed only once the revenue is generated. The alternative is a "pay-as-you-use" approach, in which the TIF authority (or local authority) issues bonds to finance development, which are then repaid by TIF revenues. TIF can be used to fund various public infrastructure projects, including sewer, water, urban roads, park improvements, public facilities, and public transportation. One of the criticisms of TIF is that directing all incremental tax to repayment of development bonds leaves no additional funds for the often larger demands for public services resulting from increased property values. For example, the use of TIF to create a residential development means increased demand for schools, without additional funding.
Extent of funding potential	The extent of funding potential depends on the actual increase in property values in the TIF district. This will vary case by case.
Implementation costs	There are significant upfront costs in developing the framework and administrative processes to implement a TIF district. There are also upfront costs to develop institutional capacity to create and maintain a TIF district – including municipal bond finance experts, financial analysts, and planners.
Case study	TIF is widely used in the United States. Forty-eight states have some form of TIF policy and it has been used since the 1950s in California. Bay Area Rapid Transit (BART) and Contra Costa Centre (CCC) Transit Village, California BART is San Francisco Bay area's heavy-rail-based commuter transit system. The BART Pleasant Hill Station is in the CCC Transit Village, which includes residential apartments, condominiums, retail space, office space, and parking. The transit village was developed through a PPP partnership between Contra Costa County, Contra Costa Redevelopment Agency (RDA), BART, and two private property development companies. The transit village was financed through various mechanisms, including TIF and cost-sharing agreements between public and private partners. The RDA used TIF funds to construct the transit village. The TIF revenues came from the "CCC Redevelopment Area," a 125-acre area around the Pleasant Hill BART Station.
Enabling requirements for success	Legal: Most U.S. states have TIF-enabling legislation. Most legislation requires testing of a "but for" requirement to establish a TIF district; this consists of proving that the area would not develop "but for" the creation of the TIF district. Planning: To establish a TIF district, most states require studies to ensure the investment is needed, as well as preliminary project plans, a redevelopment plan (TIF is often used for "blighted" areas), public hearings, and approval from elected officials.

	Public Approval: Public buy-in is critical for TIF success. Whereas some local residents may appreciate/desire the new development, others may be concerned about disruption, change, removal of historic buildings, and so forth. Institutional Capacity: Significant institutional capacity at the municipal level and within a TIF authority is required to plan, create, and manage a TIF district. Institutional capacity is also required to garner public support from the community and other public agencies at the time of district formation. Real Estate Market Conditions: The intensity and quality of redevelopment efforts, and resulting increase in property values, affect the impact that TIF can have on generating revenues. The success of TIF in the long term rests on an increase in property values, which is not always guaranteed; if property values fall, the district may face challenges repaying the TIF-backed debt.
U.S. application	All states except Arizona and California have state-level TIF-enabling legislation, although further research would need to ascertain whether TIF could be used in all of these states for transportation/transit projects. TIF has traditionally been associated with development of economically disadvantaged or "blighted" areas within urban areas, and transport projects may not always be eligible.

6.5.2 Special Assessment District (SAD) Fees

Mechanism Name	Financing Support from Shipper	
Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
	✓	
Description	SADs (also known as "Benefit Assessment Districts") are a traditional method of financing local improvements whereby individuals in a special "district" pay a distinct levy, tax, or fee for local infrastructure investments that will directly benefit them (and typically only them).[40] This is a form of value capture where the funds raised are typically used to cover financing costs. Most SADs require some type of landowner or voter approval before fees can be levied. SADs often work more effectively if coupled with a design overlay district (a local zoning plan for public and private development and construction projects in the area) that provides greater densities in return for enhanced improvements to rail stations. Properties within the SAD limit are assessed for fees based on such attributes as property value, parcel size, street frontage, likely increase in property value due to investment, and relative proximity to new investment. Infrastructure and services within a SAD can be financed using a "pay-as-you-go" method, by spending funds only as they are collected, or "pay-as-you-use," in which bonds (commonly called special assessment bonds) fund the project and SAD fees pay the debt.	
Extent of funding potential	Large sums of revenue can be generated from SADs. Their relative contribution to cover costs varies depending on the overall capex requirements for the project. SAD revenues are highly stable because they are usually fixed at the time of the SAD formation, with fees collected upfront or annually.	

[40] Shishir Mathur and Adam Smith, "A Decision-Support Framework for Using Value Capture to Fund Public Transit: Lessons from Project-Specific Analysis," May 2012. Mineta Transportation Institute MTI Report 11-14.

Implementation costs	Implementation costs are relatively low. They focus first on building community/stakeholder support for the SAD approach, to convince stakeholders that paying some extra fees for beneficial services is worthwhile. There are also upfront costs associated with estimating the specific fees each household/neighborhood should pay, which may differ because the fees should be directly proportional to the benefit to be received. Once in place, the costs of operating a SAD are relatively low.
Example/case study	Capital financing of the New York Avenue station in Washington, DC, was partially financed through funds raised from a "Transit Benefit District." The benefit district involved collecting a benefit fee from property owners within approximately 200 meters of the new station—which was then allocated to service and retire $25 million in general obligation bonds. This $25 million was matched by funding from the FTA. Other examples of SADs for transportation include the LA metro line in 1993; 17% of the first phase of the Portland Streetcar; 47% of capital costs for South Lake Union streetcar in Seattle ($25 million of $53 million); and the Fairfax County component of the Dulles Rail Transit Improvement District ($400m in properties in Tyson's Corner).[41] We are not aware of any examples of SADs being used for intercity passenger rail (Amtrak) stations in the United States. In the United Kingdom, SAD approaches are also being used for the new Crossrail Link commuter rail system. Before the central government agrees to pay any grants to a local authority, it expects to see evidence that all other possible funding sources have been exhausted. Before it agreed to partly fund the £15 billion ($25 billion) Crossrail Link project, the UK government obtained an agreement from the Mayor of London that he would introduce a special levy on businesses and commit to regular increases in fares. The mayor also committed to negotiate contributions from several property owners along the route that would benefit from the project.
Enabling requirements for success	• Establishing a SAD typically requires enabling state-level legislation, as well as a local SAD authorizing ordinance. • Institutional capacity is required within local government agencies to understand, assess, and collect the fee, particularly when multiple SADs may be in place (e.g., multiple municipal agencies each applying a special fee — water, utilities, transport, etc.). Capacity is also required in the formation of a SAD to build community support for the approach (e.g., securing property owner buy-in, city council approval). • SADs need a strong real estate market to thrive (because fees are often partially linked to property values). SADs typically rely on future growth, and existing property owners can bear a heavy burden if anticipated growth does not materialize. • SADs are more likely to be created when states restrict local government taxing or borrowing powers (e.g., by placing limits on issuing bonds). Debt raised by special districts does not qualify as traditional municipal debt, so special districts can be formed to fund infrastructure and services that would normally be the local government's responsibility.
Relevance for U.S. context	All 50 U.S. states make use of special districts to varying degrees, covering a full range of infrastructure sectors: water, environmental services, housing, transport, and so forth. The use of SADs to fund transport has grown more popular since the 1980s and has taken place in Los Angeles; Washington, DC; Seattle; Portland; Charlotte; and Atlanta (among other cities).[42]

[41] Sources: M. Miller and C. Hale, "Innovative Finance for New Rail Infrastructure," for the Australian Transport Research Forum 2011. Centre for Transit-Oriented Development (2008) *Capturing the Value of Transit* Washington, DC. United States Government Accountability Office (2010) *Report code GAO-10-781: Public Transportation—Federal role in value capture strategies for transit is limited, but additional guidance could help clarify policies* Washington, DC. http://www.gao.gov/new.items/d10781.pdf

[42] Shishir Mathur and Adam Smith, "A Decision-Support Framework for Using Value Capture to Fund Public Transit: Lessons from Project-Specific Analysis," May 2012. Mineta Transportation Institute MTI Report 11-14.

6.5.3 Impact Fees Charged to Property Developers

Mechanism Name	Impact Fees	
Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
	✓	✓
Description	Impact fees are a fee whereby a real estate developer pays money to the local government for (and prior to) the development of infrastructure and services that will serve their new development. The fees can be used to fund a spectrum of public infrastructure needs: water, sewerage, libraries, schools, transport, etc. This is another form of capturing some of the value in increased property costs to fund the services that help generate the additional value. Impact fees have been used across the world where increased urbanization has led to the need for new property development, which in turn creates higher demands for transportation (and other) public infrastructure—roads, highways, transit, etc. Fees are typically a one-off fee, levied during the permitting process for a new project development. This is in contrast to other types of value capture—special assessment districts (SADs) and tax-increment financing (TIF)—which can levy fees/taxes over the course of many years. Fees can be used for capital expenditures (including track and/or rolling stock in the case of rail) and/or ongoing operating and maintenance costs, depending on the jurisdiction.	
Extent of funding potential	Impact fees are likely to lead to highest revenues and be most successful in jurisdictions with consistently strong real estate markets and ample greenfield or in-fill development opportunities. In times of economic downturn when new property development is slow (e.g., since the recession started in the United States in 2008), the revenues can be significantly lower.	
Implementation costs	There are upfront costs to establish consistent approaches and valuation methods for assessing impact fees; the level of costs will vary depending on the number and types of development projects to which fees can be applied. Once such methods are in place, implementing them is relatively straightforward.	
Example/case study	**Transit Impact Development Fee, San Francisco** Established in 1981, a transit impact development fee (TDIF) is levied by the city and county of San Francisco to help cover the costs of the city's public transportation system. The fee is assessed on all new non-residential land uses within San Francisco with area of more than 3,000 square feet and is computed and charged to the developer prior to the issuance of the building or site permit. Fees are adjusted annually based on inflation; in 2010, the fee ranged from $8-$10 per gross square foot of space. The fees contribute a small percentage of the overall San Francisco Municipal Transportation Agencies (SFMTA) revenues (1.5% in 2007).[43] The city uses the fees to cover a portion of capital and operating spending costs of the SFMTA, which manage the funds. Permitted uses include capital costs associated with establishing, expanding, or increasing service on transit routes (including rolling stock, bus shelters, stations, and tracks) and operating and maintaining rolling stock associated with new or expanded transit services.	

[43] Shishir Mathur and Adam Smith, "A Decision-Support Framework for Using Value Capture to Fund Public Transit: Lessons from Project-Specific Analysis," May 2012. Mineta Transportation Institute MTI Report 11-14.

Enabling requirements for success	• State-level legislation is not a prerequisite for charging impact fees, and only half of the 50 U.S. states using impact fees have passed such legislation. However, the extent to which impact fees can be used specifically for transit/transportation varies. Some states prohibit the use of impact fees for transportation/transit, while others have adopted legislation explicitly allowing them.[44] • Significant institutional capacity is required to design, implement, and charge impact fees. In particular, standardized and clear procedures for assessing fees on real estate developers are essential to avoid different fees for different developers and/or manipulation of fees by developers.[45] Institutional capacity is also needed to face pressures from developers who may resist the fees. • The entity responsible for charging impact fees (municipal government or county) is often separate from the entity providing the transit (public transit authority); this organizational separation can complicate the appropriation of fees for transit. • Like other types of value capture, impact fees are suitable for rapidly growing jurisdictions with a high demand for property and increasing real estate values. Without such demand, developers need incentives (not disincentives such as additional fees) to develop property.
Relevance for U.S. context	Impact fees exist in all 50 U.S. states. The extent to which they can be used for transportation/transit projects varies across states.

6.5.4 Station Parking Charges

Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
	✓	✓
Description	Station parking charges can be set at different levels to reflect market demand and to encourage off-peak transit use. Parking rates can be varied not just by duration of use, but by other factors to encourage public transit use and generate additional revenue. For example: • Higher charges can be levied for spaces closer to the station or under cover • Lower charges or even free parking can be offered for mid-day use, of say less than 4 hours. This encourages off-peak use, when trains are empty. It also can reduce enforcement costs, as cars only need to be checked in the peaks • Free parking on weekends and holidays • Higher rates for use by non-transit riders • Multi-day rates, which can be useful for people who may need to travel during the week or are using rail for access to an airport. Some operators offer reduced rates for monthly users. Although there are lower collection and enforcement costs for these customers, a monthly discount can be counter-productive because it means, in effect, that occasional users, who more often travel off peak when there is capacity, pay more and are therefore discouraged from using transit.	

[44] Shishir Mathur and Adam Smith, "A Decision-Support Framework for Using Value Capture to Fund Public Transit: Lessons from Project-Specific Analysis," May 2012. Mineta Transportation Institute MTI Report 11-14.
[45] Abdelfatah, A. and Asma Aljassmi, "Estimating Transportation Impacts Fees." Association for European Transport, 2010.

	Some operations offer reduced rates for car pools. Car parking charges can actually be designed to increase demand for public transit use, where parking is constrained, because some "early birds" who take scarce spaces may be encouraged by high charges to switch to bus or car pool for station access, leaving spaces open for additional users.
Extent of funding potential	Varies, but might generate 5% to 10% in additional revenue.
Implementation costs	Depends on the application and strategy. Smartcard and smartphone-based fare collections systems now can be acquired with a service-provider structure, so no capital expenditure may be required.
Case study	Toronto Transit Commission In Toronto, car parking charges at transit stations vary depending on local demand. All day rates are $3 to $5. At some stations, there are higher charges for parking at lots closer to the station, with lower charges for users arriving after 9 am. TfL In London, parking at Underground (subway) stations (where it exists) is managed by a contract operator with pay-by-phone technology. This allows multi-day parking. UK Commuter Rail UK commuter rail station parking is usually managed by the franchised train operator. Parking rates are not regulated and are set to maximize overall revenues (and sometimes to reduce peak rail demand). Washington Metro Metro charges $4.50 to $5 per day, with monthly charges of $45 to $65. There is no part-day or off-peak rate; however, some stations also have meter parking at $1 per hour. Capacity is limited and some stations have waiting lists for monthly parking. Multi-day rates are offered at a few stations. Parking can be paid using the SmarTrip card and by cash and credit card. At some locations, use of station parking by non-transit users is discouraged by requiring payment using the SmarTrip card and charging a much higher rate ($8) if the card has not been used immediately previously for a transit trip.
Enabling requirements for success	Parking charges are a policy decision by the transport operator and/or owner of the parking facilities. Financial benefit needs to be evaluated on a case-by-case basis. Charges also need to be targeted so they are not just seen as another "fare increase."
U.S. application	Many U.S. metro and commuter rail operators offer free parking at stations, which is in effect a discount to passengers who drive rather than use feeder buses. With smartcard and smartphone technology, charging for parking can be integrated with the rail fare, allowing further market segmentation. Parking charges can potentially increase revenues on commuter rail lines by 5% to 20% or more.

6.5.5 Road Tolling/Congestion Charging

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
	✓	✓
Description	Road tolls are used in the United States and worldwide to collect revenues from drivers passing specific checkpoints on a given highway, road, or interchange. The revenues are then typically allocated to cover the financing of the infrastructure and/or for use toward future highway (or other) transportation improvements. Congestion charging is a form of tolling, whereby charges are applied on roads/highways leading into a particularly busy urban area. In comparison with general road tolls, such schemes are typically designed to both reduce congestion (by encouraging passengers to use other modes) and raise revenues.	
Extent of funding potential	Revenues from highway tolling account for only 5% of highway funding receipts in the US. Highway tolling is common practice elsewhere in the world, including in Europe. The costs of tolling may decline with new technology and approaches (e.g., High Occupancy Toll [HOT] lanes), making this a more feasible way to raise funds for transport (typically only used for highway investment) and to also discourage car use. The main purpose of congestion charging is rarely revenue generation; the focus is primarily on reducing congestion. However, revenue from congestion charging is often used for public transit purposes.	
Implementation costs	**Tolling:** Highway tolling is a relatively costly approach to revenue generation and is only used on controlled-access highways, major bridges, and tunnels, and a few city centers in the United States. In some cases, manual toll booths must be passed and payments made by individuals to a machine or attendant. Some states have electronic tagging technology that automatically bills license-plate holders based on the point passed/route used. New toll road projects can be built with virtually any mix of public and private financial sponsorship, with actual and/or 'shadow' tolls (paid by government, not user) paid to the private sector to contribute to covering the cost of debt financing. In Europe, several countries (e.g., France and Italy) charge high tolls on privately financed highways (e.g., for Paris-Lyon, 250 miles, the toll for an auto is $50 and for a truck $150). Tolls are even higher in Japan. **Congestion charging schemes are also costly to implement.** The technology to monitor and enforce the charging zone must be put in place and significant marketing and communications material must be developed and disseminated to the general public well in advance of the scheme. The capital cost of London's Congestion Charging system (described below) was about $200m.[46] Operating cost is about $140m per year (about 40% of revenue of $360m).[47] The capital cost of the Singapore system was $120m in 1998. Operating cost is about $10m per year (about 20% of revenue).[48]	
Case study	**Vehicle Miles Traveled** Given the declining purchasing power of fuel taxes and inflation in the costs to maintain highways, alternatives are being considered in the United States. For example, in July 2013, the Oregon legislature passed a bill to replace the state's gas tax program with a "pay per mile road usage charge" often known as a vehicle-miles traveled (VMT) tax. Drivers who make the switch will pay 1.5 cents for every mile they drive instead of 30 cents per gallon at the pump. This is the first state to make such a move, and the extent of the current law is greatly limited — participation will be	

[46] Evans 2007, *Central London Congestion Charging Scheme: ex-post evaluation of the quantified impacts of the original scheme.*
[47] Transport for London, 2012, *Congestion Charge: Changes Consultation Impact Assessment.*
[48] http://www.lta.gov.sg/content/ltaweb/en/roads-and-motoring/managing-traffic-and-congestion/electronic-road-pricing-erp.html and http://ltaacademy.lta.gov.sg/doc/ERP

	voluntary and capped at 5,000 drivers — but it still presents an interesting model for addressing the shortfall in funds for highway maintenance.[49] **Congestion Charge Example: London, UK** In an attempt to cut traffic levels and ease congestion on the severely clogged central London roads, the London Congestion Charge scheme was introduced in 2003. TfL defined a charging zone of 8 square miles in the heart of the city defined by the inner ring road. Motorists driving into the charging zone have to pay a daily standard flat fee of $20, either in advance or on the day of travel. License-plate trace technology is used. If payment has been made in advance, or if the vehicle is exempt from charges, the image is automatically deleted from the database; otherwise a penalty of $200 is applied. Charges apply between 7 am and 6 pm from Monday to Friday, excluding public holidays. In 2007, the number of chargeable vehicles entering the zone had decreased by 30% since introducing the scheme, while the level of traffic from all vehicle types was 16% lower than pre-charge levels (there were many exemptions, including taxis). By law, all surpluses must be used for London's transport. Approximately 80% of net revenue was used for improvements to the bus network, 11% on road and bridge maintenance and the rest on road safety, marketing, and pedestrian and cycling programs. Other examples of congestion charging in Europe are Stockholm, Milan, and a number of small cities.
Enabling requirements for success	Significant political will is required to implement both tolling and congestion charging schemes. The key requirement is strong local political leadership. In New York, former Mayor Michael Bloomberg developed a plan to charge motorists and trucks to enter Midtown and Lower Manhattan during the busiest weekday travel hours. Bloomberg's proposal passed several political hurdles, gaining approval from the governor, city council and one house of the state legislature, before it failed to be approved by the other house.[50]
U.S. application	Toll roads are common in the United States at the state level, although still very strongly opposed politically (particularly by trucking interests). Construction of new tolls on the existing interstate highways is generally not permitted on the federal interstate highway system,[51] although the FHWA now has pilot programs in place that permit tolling on interstate highways, including the "Interstate System Construction Toll Pilot Program."[52] Given the declining ability of the Highway Trust Fund to finance highway infrastructure, and the relatively poor condition (growing reinvestment needs) of much of the U.S. interstate highway system, using revenues from toll roads for rail projects seems unlikely in the near to medium term. Practically, revenue is more likely to be used on local services such as buses and metro than on suburban rail. This has been the experience elsewhere even where there is one authority covering a wide area that includes suburban rail services. Opposition to congestion pricing is sometimes made on the basis of equity – people fear that poor people will simply be priced off roads and transit systems, leaving free-flowing systems for the wealthy. However, such concerns ignore research indicating that higher-income travelers tend to spend a larger share of their travel time in traffic congestion than do lower-income travelers. As such, shifting to a transportation system that charges users more on congested routes and less elsewhere would improve equity compared to the current system, because higher-income drivers would be paying a greater share of the costs of transportation.[53]

[49] http://www.theatlanticcities.com/commute/2013/07/era-pay-mile-driving-has-begun/6150/

[50] Clifford Winston. "On the Performance of the US Transportation System: Caution Ahead. Clifford Winston." Journal of Economic Literature, 2013, 51 (3), 773–824.

[51] E. Reagan and Steve Brown, "Building the Case for Tolling the Interstates," *Tollways*, Spring 2011.

[52] US Department of Transportation, Federal Highway Administration, Tolling and Pricing Program. http://www.ops.fhwa.dot.gov/tolling_pricing/interstate_constr.htm (accessed January 8, 2014).

[53] Bipartisan Policy Center, "Performance Driven: a New Vision for US Transportation Policy." National Transportation Policy Project, June 9, 2009. http://bipartisanpolicy.org/sites/default/files/NTPP%20Report_0.pdf (accessed February 1, 2014).

6.5.6 Heavy Goods Vehicle (Truck) Charges

Sector	Freight	Passenger
	✓	
Type of cost	Capex	Opex
	✓	✓
Description	Heavy Goods Vehicle (HGV) charges are supplementary charges (in addition to vehicle registration or excise duties, fuel taxes, and tolls) for HGVs to use highways. The funds are then placed in the general fund and/or used as part of a dedicated transport fund. Traditionally charges have been levied for a time period (from a day to a year). In several European countries, including Germany, France, and Switzerland, these flat rate charges have been replaced by distance-based charges. To determine the charge, the distance traveled in the country is usually multiplied by the maximum authorized weight according to vehicle license (this avoids the problem of collecting data on actual loads). The ton-kilometers calculated are then multiplied by the charge rate. The purpose of the fee is to charge actual road users for the cost of highway maintenance and emissions and provide funds for investment in alternative, more environmentally friendly modes (usually rail), thereby keeping the funds in the transport sector. Together these lead to a modal switch of traffic from road to rail.	
Extent of funding potential	The funding potential depends on level of charges and amount of traffic to which it applies. It can be considerable. • In Switzerland (population 8 million) in 2012 distance-based HGV charges provided nearly $1 billion for financing major rail projects across the Alps (a further $800 million was provided from other sources – mainly from Value Added Tax). • In Germany (population 82 million), where HGVs over 12 tons are subject to a distance-based charge for the use of motorways and four-lane roads, revenues were $6 billion in 2010.[54] Of this, $1.4 billion was invested in rail, and the rest mainly in highways. Extrapolating this to the larger United States economy and its higher transport intensity, these examples suggest the United States could raise tens of billions of dollars for rail investment from this source.	
Implementation and operating costs	In Switzerland in 2002 (the year after implementation) the implementation costs for the charging system were roughly 8% of gross revenue.[55] In Germany the operating costs were 30% of revenue in 2010.[56]	
Case studies	Some countries in Europe charge fees on HGVs, with revenues transferred to a central transportation fund. Switzerland introduced distance-based charges, known as a Heavy Vehicle Fee (HVF), in 2001 following a popular vote. It applies to all vehicles for the transport of goods with a total permissible laden weight over 3.5 tons. Switzerland has higher HGV charge rates than other countries partly because of the very sensitive environment in the Alps and public concern about transit traffic impact on the roads and environment. Average charges were 3.5 U.S. cents per ton-km in 2012. A further attraction of HGV charging in Switzerland (and Germany) is that a high proportion of trucks are from outside Switzerland and so they pay no local excise or registration tax. This HGV charge ensures that out-of-country users of the Swiss transport infrastructure contribute in part to its maintenance.	

[54] VIFG, 2012, *PPPs for Transport in Germany: Present and Future Dealing with PPPs for Transport in Times of Economic Uncertainty.*
[55] C. Nash et al., 2004, *Charges for heavy goods vehicles: EU policy and key national developments.*
[56] VIFG, 2012.

	Partly with the proceeds of distance-based charges, Switzerland adopted an innovative approach to funding investment in rail lines through the environmentally sensitive mountainous Alps that separate Italy from Northern Europe. Investment in rail has been financed by a special fund (FinöV), which is mainly financed by a HVF. This combination of the carrot of new railway infrastructure and the stick of higher road charges has had a significant impact on modal split for freight through the Alps. FinöV also receives funding from value added tax (VAT – up to 0.1% of VAT receipts) and fuel tax (up to 25% of fuel tax receipts are assigned for the transalpine base rail tunnels). Finöv is the most important means of funding the New Rail Links through the Alps (known as NEAT), providing funding even after construction. Originally up to 25% of FinöV's funds could come from loans from the government (to be repaid by the railway receiving the funds) but, due to its impact on railway finances (the freight part of SBB is heavily loss making), this was abandoned and all financing is now provided in the form of grants. In Germany, HGVs must pay tolls for all long-distance trips. The toll is paid on the internet and enforced by random inspection. The toll rate varies from about $0.30 to $0.60 per mile, depending on vehicle size and type. Lower rates are charged to low-emission vehicles. Between 2005 and 2010 a multi-modal transport infrastructure fund (VIFG) received funding from tolls on HGVs with more than 12 ton loaded weight and from users of inland waterways. Its funds were only used for investment in transport infrastructure. Until 2010 this included all modes but since then the funds have only been used for roads.
Enabling requirements for success	To increase acceptability, it is important to gain political and popular support and it can help provide a compensating advantage to truckers. The high charges in Switzerland were made acceptable to the trucking industry by a simultaneous increase in vehicle weights from 28 to 40 tons (the limit in most other European countries), which offset the increase in cost.
U.S. application	Oregon has been charging heavy trucks a weight-mile tax since 1947 and does so in lieu of fuel taxes for this vehicle class only. Kentucky, New Mexico, and New York also use variations of the weight-mile tax in combination with fuel tax for their highway use taxation.[57] Before HGV charges can be used widely in the United States, the key challenge is how to gain political and popular support as in Switzerland. It may be easiest to gain acceptance in areas with sensitive environments, such as across mountains.

6.5.7 Gas Tax

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
	✓	✓
Description	Gas taxes have been used to fund road costs for over a century as a form of road use charge. They are simple to administer and generally simple to enforce. They are also perceived as equitable, because payment is proportional to fuel consumption, which in turn is broadly proportional to road usage. They are also a good surrogate for carbon emissions. In reality, a gas tax has flaws. Heavy vehicles cause disproportionate damage to the road and the environment, more than reflected in gas taxes which are proportional to gas usage. Peak-hour commuters pay more than the costs of the damage they do	

[57] National Surface Transportation Infrastructure Financing Commission, US Senate, Washington DC, 2009, *Paving the Way.*

	to roads, but do not usually pay enough to reflect the costs they impose on others due to congestion. With improvements to fuel economy and the emergence of hybrid and plug-in electric vehicles, gas tax revenues are now falling and it may become unsustainable as a revenue source (as is the case for the Highway Trust Fund in the United States). The transportation community agrees that alternatives to a gas tax need to be considered, including mileage-based user fees of some sort. One important difference between Europe and U.S. transport funding is that fuel taxes and other road user charges (e.g., vehicle registration and road tolls) are generally much higher in Europe. In some countries, fuel taxes and other road charges are several times higher than the funds actually spent building and maintaining the road system. Although these charges do not generally cover all the external costs of road use,[58] they encourage more traffic to use passenger rail by discouraging people from driving cars. For example, Germany uses fuel taxes to support regional and suburban passenger transport.
Extent of funding potential	The total funding potential from gas taxes is very large (though eroding, given points mentioned above). For example, each 1 cent/gallon of transportation fuels tax in the United States yields about $1.7 billion/year and, in the United Kingdom, gas taxes raise £26 billion or $40 billion a year, 1.7% of GDP. Allocating funds from gasoline tax for non-highway investment purposes can be politically challenging, although possible (e.g., part of the Highway Trust Fund revenues from gas tax in the United States goes to the Mass Transit Account).
Implementation costs	Implementation costs for simply increasing the current gas tax in the United States would be minimal. Shifting to a mileage-based system would, however, be relatively costly to implement. However, smartcard and smartphone-based road charging systems now can be acquired with a service-provider structure, so no capital expenditure is required.
Case study	The U.S. Highway Trust Fund (HTF) is funded through a federal fuel tax of 18.3 cents per gallon on gasoline, 24.4 cents per gallon on diesel fuel, and excise taxes on tire, truck, and trailer sales, as well as heavy vehicle use. The HTF can be used for two accounts: the "Highway Account" which funds road construction (opening balance of $9.7 billion in October 2012) and the smaller "Mass Transit Account" for mass transit projects (opening balance of $5.2 billion in October 2012). In recent years, the revenues of the fund have been inadequate to meet needs and the HTF has been propped up by transfers from the Federal General Fund.[59] Most states impose fuel taxes on about the same level as the federal taxes.
Enabling requirements for success	More than anything, a political will to increase gas taxes is required. State legislation would also likely need to be in place to facilitate increased taxes. Charges need to be targeted so they are not seen as just another "tax increase."
U.S. application	The U.S. HTF is funded through a federal fuel tax of 18.3 cents per gallon on gasoline, 24.4 cents per gallon on diesel fuel, and excise taxes on tire, truck, and trailer sales, as well as heavy vehicle use. The HTF raises about $30 billion annually but the shift to more fuel-efficient vehicles and a slowing in the number of vehicle miles driven has reduced trust fund revenues in recent years. The fund is now being supplemented by transfers from general tax revenues.[60] Discussions are ongoing about a long-term fix of the HTF at the federal level in the United States. As the gas tax is eroded by use of hybrid and plug-in electric vehicles, many states may follow Oregon's lead toward use of VMT charging approaches.

[58] European transport policy, progress and prospects, Institute for Transport Studies, University of Leeds. 2009. http://www.cer.be/publications/studies/studies-details/european-transport-policy-progress-and-prospects/
[59] FHWA "Status of the Highway Trust Fund," http://www.fhwa.dot.gov/highwaytrustfund/ (accessed July 31, 2013).
[60] FHWA "Status of the Highway Trust Fund," http://www.fhwa.dot.gov/highwaytrustfund/ (accessed July 31, 2013).

6.5.8 Car Registration Plate Auction

Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
	✓	✓
Description	The number of new vehicle registrations issued each period (month or year) would be strictly limited, below the actual demand, with the available registrations sold by auction. Although there would be no limit on the purchase of automobiles, without a registration they could not be used on public roads.	
Extent of funding potential	The fundraising potential from this tax is very large.	
Implementation costs	Implementation costs would be minimal because most states already levy a registration charge.	
Case study	Singapore and several cities in China limit the number of new motor vehicle registrations each year as a form of traffic restraint. Arrangements vary by city, but usually only locally registered cars are allowed to be driven in peak hours, within a designated area. Few new car registrations are sold each year, by auction. Existing registrations may be transferred to a new vehicle.	
Enabling requirements for success	State legislation would be required.	
U.S. application	Enforcement could be difficult, other than in geographically isolated Hawaii and Alaska, if the charge is set at a high level. Additional regulation might be necessary to prevent people from avoiding it by registering their vehicles in neighboring states.	

6.5.9 Motor Vehicle Registration Fees

Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
	✓	✓
Description	Most states set motor vehicle registration fees at a level that covers the cost of administration, typically $25 or $50 per year. However, much higher charges can be levied to raise funds for transport investment and to encourage more sustainable forms of transport.	
Extent of funding potential	The fundraising potential from this tax is very large. For example, the UK government collects about £6 billion ($10 billion) each year from motor vehicle registration fees or about £100 per resident on average.[61]	
Implementation costs	Added implementation costs would be minimal because most states already levy a charge.	
Case study	UK Motor Vehicle Registrations In the United Kingdom, motor vehicle registration fees are set to discourage car ownership and encourage use of lower-emission vehicles (and use of public transport).	

[61] See http://webarchive.nationalarchives.gov.uk/20130129110402/http://cdn.hm-treasury.gov.uk/budget2012_annexd.pdf

	The initial registration and annual renewal fees vary by age and emissions, in 13 "bands." Registration is actually free for very low-emission vehicles. Fees for a medium-sized car are $400 to $600 for a new car, and then typically $200 to $400 per year. The fee for a new SUV can be about $1,600 in the first year, then about $700 per year.[62] For heavy vehicles, the annual fees are up to $3,000. Hawaii Motor Vehicle Registrations Although most states charge a flat registration fee, a minority charge by vehicle weight, age, weight and age, or value may be levied. In Hawaii, cars are charged by weight. The annual registration fee for a large car can be $500.[63] In a medium-sized state with 5 million motor vehicles, an average charge of $200 could raise $1 billion per year in additional revenues.
Enabling requirements for success	Legal: State legislation would probably be required. Jurisdictional/Institutional Coordination: Enforcement could be difficult.
U.S. application	Other than in the geographically isolated states of Hawaii and Alaska, if the fees are set at a high level, additional regulation might be necessary to prevent people from avoiding them by registering vehicles in neighboring states. This might also be achieved with legislation and perhaps also multi-state compacts.

6.5.10 Vehicle Mileage-Based User Fee

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
	✓	✓
Description	A simple mileage-based highway user fee is an alternative to a fuel tax. In this plan, highway use fees would be added to annual tax return statements with filers reporting last year's odometer reading (from last year's tax report) and this year's odometer reading, subtracting so as to provide a mileage-driven quantity to which a fee can be applied. In the simplest application, a constant fee (say $.01 per mile) can be applied to the miles driven and reported on a taxpayer's 1040 form and collected with annual income tax filings. The mileage fee would directly fund the HTF or a new "transportation trust fund," not go to general revenues. A fee so collected can be transparent and can provide an annual funding source for transport projects. Fees so collected could, under new legislation, be allocated to the states based on mileage reported for taxpayers in each state or on any other basis defined by law. This simple tax could be modified in straightforward ways to collect more from heavier vehicles (using a table identifying already designated vehicle classes based on weight—e.g., Class I and Class II). Different mileage rates for each class of vehicle would result in use charges more closely related to highway damage. Jurisdictions that elect to have more technologically sophisticated road use reporting systems could provide that information in lieu of citizens reporting on their tax returns. Commercial entities can be subject to a mileage-charge treatment using a similar simple format for computing additional or supplemental usage fees. This tax could replace gasoline taxes or be used to supplement existing fuel tax systems.	

[62] See http://en.wikipedia.org/wiki/Vehicle_Excise_Duty for full details.

[63] See http://www.civilbeat.com/articles/2010/11/08/5028-hawaii-vehicle-registration-fees-favor-the-rich/. Like most taxes other than income tax, it is sometimes criticized as "regressive" because it takes a higher proportion of income from poorer people even though the actual amount they pay will be less because they usually own fewer and older cars. In the United Kingdom, there is anecdotal evidence that the resale price of cars is reduced to reflect the tax.

Extent of funding potential	The total funding potential from a vehicle mileage tax is very large. For example, a 1-cent per mile tax would yield about $30 billion/year, with a typical driver paying about $120 per year per vehicle. Allocating funds from fuel- and mileage-based taxes for non-highway investment purposes could be politically challenging but should be possible, especially where the investments can be shown to reduce congestion.
Implementation costs	Implementation costs for a simple vehicle mileage tax would be minimal but not inconsequential. Shifting to a simple mileage-based system would require audit capabilities but there are many sources of such audit information. Most states have periodic vehicle inspection systems for vehicle emissions and safety which require odometer readings. These data could be cross-checked against the simple tax return odometer readings to ensure rough mileage reporting. Odometer readings are also captured on sales and licensing renewals, providing another source to cross-check annual reported odometer readings. The simple method that depends on annual reporting of total mileage driven eliminates privacy fears associated with more intrusive data capture systems. It also eliminates the need to equip vehicles with GPS or other tracking systems and technologically related miles-traveled collection systems.
Case study	Some states are already experimenting with vehicle mileage-based taxes. The Oregon VMT Pricing Pilot Project conducted in 2006 tested the viability of replacing motor fuel taxes with a mileage charge. In this pilot, 5,000 vehicles are participating in a GPS-based vehicle mileage tax scheme at a price of $0.015/mile; volunteers for the experimental system are refunded some state fuel tax charges. The U.S. Senate Commission report concluded that the pilot project demonstrated that the concept of moving to a comprehensive pricing scheme is viable but that various technical, administrative, and public concern hurdles will need to be overcome. The report further concluded that the mileage-based user charge is the most viable and sustainable long-term "user pay" option for the federal government to raise adequate and appropriate revenues to provide the federal share of funding for the system. A VMT fee system was the only option the commission evaluated that would both raise revenues and reduce the amount of necessary additional capacity on the highway system. The simplified vehicle mileage-based tax proposed here could be implemented while allowing states and local authorities wishing to implement more complex congestion-based charging schemes in urban areas to do so. Or, like Oregon, a more technologically advanced system could be accommodated within the simple vehicle mileage-based federal system. Over time, if citizens in some states voted in favor of more technologically based mileage tracking schemes, the data collected could be forwarded to taxpayers or to the IRS in a 1099-like filing to inform income tax filers without referencing their odometer readings. States with periodic vehicle inspections could also issue advisory 1099-type statements reporting vehicle mileage to simplify taxpayer reporting.
Enabling requirements for success	A new federal law implementing a simple vehicle mileage-based tax would be required. Political opposition to a vehicle mileage-based tax scheme would be likely. It would be seen as a tax increase. However, this is a problem that must be faced by any revenue-raising scheme if the HTF is to be adequately funded. The simplified vehicle mileage tax is straightforward and provides a transparent method to raise funds for federally supported highway programs. A tax increase will be needed in any event; the SVMT is simple, immune to reductions in fuel consumption, and respects privacy concerns held by many citizens.
U.S. application	U.S. citizens file tax returns each year in a system based on honest self-reporting and is generally considered to be effective and efficient. As tax laws have become more complex, more taxpayer diligence has been required. The simplified vehicle mileage-based tax system proposed here requires relatively simple taxpayer effort.

6.5.11 Payroll Taxes Used for Transport

Sector	Freight	Passenger
		✓
Type of cost	Capex	Opex
	✓	✓
Description	A number of areas worldwide require employers to pay a payroll tax for employees working in specific urban areas. The revenues from the tax are typically allocated (in whole or in part) for use toward transportation investment, and transit specifically, in those urban areas.	
Extent of funding potential	The funding potential depends on the extent of the program, including geographic size of the taxation zone, tax rate, and minimum threshold above which taxes must be paid (small businesses are typically exempt from such schemes).	
Implementation costs	Administrative costs are associated with establishing the payroll tax collection systems (e.g., new forms, public awareness, and online filing ability), but once these are in place the collection costs are relatively low.	
Case study	The State of Oregon has a "Transit Payroll Tax" in place. The tax rate is approximately 0.7% and applies to gross salary. The Oregon Department of Revenue administers tax programs for the Tri-County Metropolitan Transportation District (TriMet) and the Lane County Mass Transit District (LTD). Nearly every employer who pays wages for services performed in these districts must pay the transit payroll tax. Wages include all salaries, commissions, bonuses, fees, payments to a deferred compensation plan, and other items of value. The tax must also be paid by the self-employed. Transit tax is reported and paid quarterly.[64] The state of New York also has a payroll tax in place for the New York City area, with proceeds going to the MTA. The metropolitan commuter transportation mobility tax (MCTMT) is a tax imposed on certain employers and self-employed individuals engaging in business within the metropolitan commuter transportation district (MCTD). This includes the counties of New York (Manhattan), Bronx, Kings (Brooklyn), Queens, Richmond (Staten Island), Rockland, Nassau, Suffolk, Orange, Putnam, Dutchess, and Westchester. The tax rate applied ranges from 0.11% to 0.34%, with employers with larger payrolls paying more (employers with a total payroll of less than $312,500 per quarter are exempt from paying the tax in that quarter). Taxes are due quarterly.[65] In France, a key tool for public transport financing is the "Versement de Transport" (VT), a tax levied on gross payroll for companies employing more than nine workers. Established in 1971, the tax originally applied exclusively in Paris, but the applicability of the scheme has been extended to smaller cities and can now be used by any town with more than 10,000 inhabitants (as of 1999). The use of the VT has now been introduced in more than 85% of urban areas. The tax rate varies by size of the population; in Paris it ranges between 1.4% and 2.6%. The funds were originally intended to raise capital for investment in infrastructure, but are increasingly used to cover operating costs. The VT revenues are a critical source of financing; for example, in 2011, the VT receipts accounted for 37.4% of revenues for public transport in the Paris metropolitan area, while ticket sales accounted for 30.3%.	
Enabling requirements for success	Legislation must be established to enable tax collection. Significant political will is also required at the state and local level to make this tax acceptable to voters.	
U.S. application	Some U.S. states have a transit payroll tax established through state legislation. No such taxes exist at the federal level.	

[64] Government of Oregon, Department of Revenue. http://www.oregon.gov/dor/BUS/Pages/IC-211-503.aspx (accessed January 14, 2014).

[65] New York State Department of Taxation and Finance, "Guide to the Metropolitan Commuter Transportation Mobility Tax." http://www.tax.ny.gov/pdf/publications/mctmt/pub420.pdf (accessed January 14, 2014).

6.5.12 Sales Tax

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
	✓	✓
Description	Sales taxes in various forms have been used for many years to support highway construction. Various states and localities have used sales taxes (expressed as a percent of the sales price) on fuel and other road transport items (e.g., on tires, batteries, and other equipment) to fund transport infrastructure. Some communities and states have voted to add a fraction of a percentage to the local and state-approved sales tax burden to support local transport services. For example, in 2008, Los Angeles County voters approved a ballot measure to raise sales taxes by 0.5% for 30 years with the proceeds dedicated to transit and freeway improvements.	
Extent of funding potential	Depends on local tax base and the size of the sales tax increase. Can be billions per year.	
Implementation costs	Implementation costs are not high unless political costs are considered. In congested areas, ballot measures generally win approval. Many tax increases are term-limited (e.g., they are for 5 years or 30 years). Most extensions of transit/transportation-based sales taxes also win when there is experience in improving road transport, expanded bus services, or other results.	
Case study	California A 0.25% sales tax increase dedicated to transport was enacted by the State of California in 1971 (Transportation Development Act), and this is generally allocated to the jurisdictions where the taxes are raised. Los Angeles County voters approved a 0.5% sales tax dedicated to transport through Proposition A in 1980; they approved an additional 0.5% sales tax increment for transport through Proposition C in 1990. Proposition R, another 0.5% dedicated sales tax increment was approved in 2008 but was limited to a 30-year term. These measures, totaling about 1.75% sales tax, provided about $2.2 billion in funding for Los Angeles County transportation services; the funds include subsidy support for transit and highway operations as well as contributions to transport infrastructure investment projects. The original proposal for HSR in California (2000 Business Plan) was based on a 0.25% sales tax that would have fully funded the system. In 2013, the voters did not approve an extension of the 2008 tax increase (Proposition R) for another 30 years beyond the term approved in 2008. Virginia In 2013, Virginia passed legislation[66] to create a sustainable revenue stream for its IPROC fund by allocating part of retail and sales use tax to IPROC. Specifically, in July 2013, the state raised the retail and sales use tax rate by 0.3% statewide, with an additional 0.7% increase in Northern Virginia and Hampton Roads districts.[67] Of this increase, 0.125% was allocated to transportation funding: 40% to IPROC and 60% to the Mass Transit Fund. Committing this portion of Retail Sales and Use Tax revenue to IPROC is expected to yield $44 million for IPROC in 2014, with growth expected to reach $56 million annually by 2018, representing an increase in rail funding of 86% compared to 2013.	

[66] "Virginia's Road to the Future" (HB 2313).

[67] Retail Sales and Use Tax in the state ranges from 5.3%–6% for most purchases. Virginia Department of Taxation http://www.tax.virginia.gov/site.cfm?alias=changesandupdates#RetailSalesUse

Enabling requirements for success	In most cases, a voter referendum is required. In some jurisdictions, referenda increasing tax rates (sales and property taxes) requires a two-thirds majority. Still, most sales taxes dedicated to transport infrastructure and services are approved (about a 75% approval rate in recent years).
U.S. application	Dedicated sales taxes are in common use in the United States and are applied statewide and on local sales. These taxes provide a predictable source of funding for transit operations and infrastructure projects requiring matching funds from state and federal agencies and often provide a basis for guaranteeing tax-exempt bonds. Innovative ideas to fund transport infrastructure include a proposal by a New Jersey lawmaker to legalize marijuana, tax it, and use the revenue to pay to fix the state's roads and bridges.

6.5.13 Carbon Tax or Credits (Cap-and-Trade)

Sector	Freight	Passenger
	✓	✓
Type of cost	Capex	Opex
	✓	✓
Description	Another potential means to raise funds for passenger services may be by collecting revenues from carbon taxes or carbon trading programs. Experience to date with these options is uneven, but they may offer potential for raising funds for passenger rail projects. Carbon taxing is not popular because of the politics of raising taxes. Carbon emissions trading, in which emitters purchase permits in an open auction, might accomplish the same objective with less political opposition. Emissions trading, also known as "cap-and-trade," is a market-based approach in which, at least in theory, the price of emissions will be borne by those who most need to make the emission, and the cost of reductions will be borne by those who can achieve it at least cost. The system works through a central body (typically a government agency) setting a limit on the amount of a pollutant that may be emitted, with permits sold to polluting entities (firms and presumably state agencies if they are significant emitters) based on their levels of emissions. The revenue is generated through the sale of permits. The total number of permits cannot exceed the cap, and any firm wishing to increase its volume of emissions must buy permits from those who require fewer permits. Over time, emissions can be reduced by reducing the volume permitted. The United States has had cap-and-trade programs for SO_x and NO_x in operation since 1990 with considerable success. Carbon trading has been more controversial and no such program exists at the national level. California has said one source to raise funds for its HSR program will be from California's quarterly auctions of greenhouse-gas (GHG) emissions allowances.	
Extent of funding potential	Carbon taxes or carbon cap-and-trade regimes could generate enormous revenues for funding various programs, including passenger rail. This would be especially true if taxes or caps were extended to emissions from motor and aviation fuels. For example, each 1 cent/gallon of transportation fuels tax in the United States yields about $1.7 billion/year (equivalent to a tax of $1.2/ton CO_2 equivalent and about $4.2/ton carbon). In California, 1 cent/gallon would yield around $170 million/year and 20 cents/gallon would finance the entire HSR program without any other sources. The expected proceeds generated in California have been estimated at approximately $5 billion annually. The question is whether or not rail passenger service is the most cost-effective way of reducing emissions of all kinds as compared, for example, with investing in electric charging stations for electric automobiles.	

Implementation costs	The administrative costs of cap-and-trade programs are not excessive, involving staff and facilities to set up the cap levels and then manage distribution either through auction or distribution. For example, the California Air Resources Board (CARB) reports that the CA cap-and-trade program administrative costs are about $7 million annually. There is no reason to believe that a carbon tax program would cost more. Administrative costs are not, of course, the only costs involved. The cost of each participant to decide what its costs are and the related value of emissions permits must also be significant, and there could also be economic costs if the permit prices or carbon taxes significantly distort the market. The net result is debatable, but many estimates have argued that the benefit-cost ratio of cap-and-trade or carbon tax programs is substantially greater than one.
Case study	The California cap-and-trade program is designed to reduce greenhouse gases (GHGs) from multiple sources to 1990 levels by 2020. The program will cover electric utilities and large industrial facilities at first, but will expand in 2015 to cover distributors of transportation, natural gas, and other fuels. The program sets a firm limit or "cap" on GHGs that, beginning in 2013, will decline by approximately 3% each year. With a carbon market, a price on carbon is established for GHGs, spurring technological innovation and investments in clean energy. Auction of permits by the State Air Resources Board will generate nearly $2 billion annually, although this amount may change in future years, depending on the balance between new permits and trading of existing permits. When transportation fuels are added, the total amount raised could increase to as much as $4 billion to $5 billion annually. In its 2014 Business Plan, the CA HSRA showed a total investment cost of the high-speed system from San Francisco to Los Angeles/Anaheim of $68.4 billion ($68 billion in YOE terms, $54 billion in 2013$), leaving an enormous gap from the $11.7 billion reliably in hand ($8.2 billion from Prop 1A bonds and $3.5 billion from federal sources). The gap was actually larger because Prop 1A bond funds require a 50/50 match, so only $3.5 billion had actually been "unlocked." The Authority proposed to fill this gap with an added $38.4 billion in federal support (assuming a new federal program) along with unspecified private investment of $13.1 billion and other state, local, and private funding of $5 billion. If federal funds are not available in the amounts projected, the governor supported the HSRA's proposal to dedicate $250 million to $400 million of the cap-and-trade funds to fill at least part of the gap needed to unlock the Prop 1A funds. Revenues from the program are dedicated to projects that reduce CO_2 emissions, and HSR would arguably be an eligible use. With this said, the proposal has been met with skepticism and opposition for several reasons, primarily because there are multitudinous claimants for the money, and also because the HSR system would at most account for 0.2% of the overall state reduction target, raising a substantial question about the relative benefits of HSR versus other uses. In addition, it would in effect take the entire income from the trading program (from $2 billion to the highest estimate of $4 billion or $5 billion/yr.) to close the gap fully, so there is little question that other sources would be required. In his 2014/2015 budget, Governor Brown proposed $250 million for HSR (raised to $400 million), along with use of 33% of the cap-and-trade income in future years. The final compromise was for $250 million in 2014/2015 along with 25% of all future funds generated, which could yield up to $1 billion annually. Even so, a substantial gap will continue to exist between total costs and revenue sources in hand. The program will require reauthorization in 2021.

Enabling requirements for success	Positive political support for reduction of CO_2 emissions is required, including acceptance of the price impacts (on fuels and energy) of tax or trading regimes. The legal framework already exists in the United States in the clean air cap-and-trade programs, but revenues would need to accrue to government(s) rather than accruing to existing emitters.
U.S. application	Carbon taxes or carbon trading regimes could generate enormous revenues for funding various programs, including passenger rail. This would be especially true if taxes or caps were extended to emissions from motor and aviation fuels. The question is political will in the first instance and deciding whether rail passenger service is the most cost-effective way of reducing emissions of all kinds as compared, for example, with investing in electric charging stations for cars.

6.6 Financing Mechanisms

6.6.1 Public-Private Partnerships (PPPs)

Sector	Freight		Passenger	
	✓		✓	
Type of cost	Capex		Opex	
	✓		✓	
Description	The term Public-Private Partnership or PPP is very broad, but typically refers to a cooperative and legally binding venture between the public and private sector that allocates responsibilities, risks, and rewards in the delivery of an infrastructure project and/or service. A PPP can have financing features, but it is more than a financing mechanism. It is a project and service delivery mechanism. Basically, in a PPP, the public sector defines the specific output and/or service level it is seeking—for example, a commuter rail system and operation that will deliver a specified level of service/capacity. The public sector then contracts with the private sector (generally through a competitive procurement process) to deliver a solution that meets those output and/or service standards. PPP contracts typically leave it to the private sector to determine how to most efficiently and innovatively deliver the infrastructure and/or service in question.			
Purpose	PPPs can use private capital to finance a project. For instance, a PPP project may see a private-sector entity raising capital to cover a rail project's capital costs, and this investment would be recouped over time through revenues associated with the project. When a project has a funding gap, public funding is required to make PPPs work. PPPs are also used as a project delivery mechanism to transfer project risks to the private sector, including design, construction and operating risk. When properly designed, PPPs effectively promote on-time, on-budget delivery of projects. PPPs also encourage innovation and efficiency in the delivery of the project or service. From a financial standpoint, PPP financing could be used by a public-sector entity to defer the capital cost of the project until its completion (e.g., where the private-sector partner is not paid until it delivers the infrastructure to the set standard). PPP financing can also smooth future payments for the infrastructure service over the life of the asset/operation.			
Typical terms	Amounts available	Cost of money	Term	Structure
	$50 million to multiple $ billions	Varies with project risk. Generally greater than 15%	Depends on PPP structure. Generally 5 to 30 years	Many different structures (See Table 6-4)

Extent of financing potential	What the private sector is actually contacted to deliver and finance in a PPP can vary greatly. A PPP project could (1) be limited to the delivery of infrastructure (i.e., design and construction), with no financing component; (2) include basically everything involved in the delivery, financing, and management of infrastructure and services (i.e., design, build, finance, operate, and maintain); or (3) include something in between (see Table 6-4).
Implementation and operating costs	PPP projects are generally more complex than projects developed using traditional procurement approaches and can require significant upfront planning costs, typically requiring the use of external advisors (e.g., lawyers, financial advisors, and process advisors) and related transaction costs. Private capital is also more risk/return-driven and thus more expensive than public money.
Case studies	PPPs have been used extensively internationally for the development, financing and operations of transportation projects. PPPs have been used most in the United Kingdom, including for High Speed 1 (formerly the Channel Tunnel Rail Link), which is the largest rail scheme in the United Kingdom financed through a PPP. The use of PPPs on rail projects has been largely limited to greenfield projects, for which a revenue stream can be clearly linked to the investment, but it is difficult to make traffic and revenue forecasts for greenfield projects. PPPs have been most successful for small to medium-sized, off-network projects (e.g. freight interchanges, car parking, train maintenance facilities, and station refurbishment).
Enabling requirements for success	PPPs typically require some form of enabling law. Beyond this, they require significant upfront planning to ensure that the project is structured appropriately (e.g., appropriate allocation of project risks) and that it will deliver value for money. PPPs also require a relatively predictable and sufficient future revenue stream, failing which a project would be very difficult to undertake as a PPP.
U.S. application	The concept of PPPs is relatively new in the United States in the transportation sector. The degree to which PPPs can become more broadly used in the United States will in part depend on the extent to which the lessons learned from existing experiences can be built on and shared for the benefit of stakeholders across the country. The unique context of the U.S. rail sector is discussed in Chapter 2.

Table 6-4. Alternative PPP Project Structures and Risk Allocation

PPP Project Components	Description	Typical Risk allocation*					
		Design	Construction	Financing	Operations/ Maintenance	Ridership/ Frequencies	Revenue
Design-Build (DB)	Private sector responsible for design and construction only. Public agency finances, operates, and maintains system. Examples: Chiltern Railways, UK Contract length: limited to length of design and construction period.						
Design-Build-Finance (DBF)	Similar to Design-Build, but private sector also finances the design and construction of the project and gets paid by the public sector only once the infrastructure is completed to the standards established in the PPP contract. Used mostly for smaller projects. Examples: demolition and reconstruction of Coventry Road Bridge in Birmingham, UK Contract length: limited to length of design and construction period.						

(continued on next page)

Table 6-4. (Continued).

Design-Build-Operate-Maintain (DBOM)	Private sector to operate and maintain a system/service, in addition to designing and building it. The operating and maintenance component is akin to a management contract. This approach works best when public sector wants to increase role of the private sector but still wants to hold on to a significant share of control. Examples: Outsourcing of operations to private sector, management contracts Contract length: variable and typically between 5 and 25 years						
Design-Build-Finance-Operate-Maintain (DBFOM)	Similar to DBOM, but private sector finances all or part of construction. Public-sector role is limited to acquiring rights of way and establishing system and service standards. Key types of DBFOM contracts discussed below. Examples (some with construction, some without): Denver Eagle Commuter Line, France/Spain Perpignan-Figueras Project, UK Channel Tunnel and High Speed 1, Intercity Express Programme Contract length: varies, but typically longer than DBOM in order to enable the private sector to realize returns, 5-30 years or longer						
	• DBFOM—Availability payment. Payments made to contractor based on provision of minimum level of service. Private sector faces no risks related to ridership or demand revenue.						
	• DBFOM—Shadow fee. Contractor receives periodic shadow fee payments from government in place of, or in addition to, real or explicit tolls paid by users. Government retains revenue risk.						
	• DBFOM—Real user fee. Contractor receives revenues directly from users and takes all ridership risk. Typically only used when service has potential to be profitable.						
Franchising or concessioning of existing operations	Public sector contracts with the private sector for the provisions of rail service on existing infrastructure (typically though a competitive procurement process). This results in a shift from funding annual operating losses directly to providing a subsidy on a contractual basis to the private operator. Depending on the structure, the private operator may be allowed to set prices and determine operating frequency and capacity, subject to minimum government specifications and regulations. These private operating companies can issue bonds and borrow commercially on the open market, thereby providing an additional opportunity to attract private financing. Example: UK Passenger Train Operating Companies Contract length: varies, 5-10 years typical	NA	NA				

*Light Shading: Public. Darker Shading: Private or part private
Source: CPCS Analysis

6.6.2 Equipment Trust Certificates (Available to Private Companies)

Sector	Freight	Passenger		
	✓			
Type of cost	Capex	Opex		
	✓			
Description	Equipment trust certificates are a form of secured debt financing. A trust certificate is "sold" to financial institutions or other investors (pension funds). The railway selects the equipment owned by the "trust" during the payback term. The equipment, with the large down payment, represents the security for the investors. The equipment is not considered railroad property in bankruptcy. Equipment trust certificates usually provide low-cost financing because of the security provided by the equipment. When there is an investment tax credit, interest costs are even lower because the owners of the certificates earn the tax credit. Usually, equipment trusts are cheaper than a finance lease, but have different payment structures. Equipment trusts are also used to finance aircraft.			
Purpose	Equipment trust certificates are typically used to finance fungible but expensive vehicles (e.g., railway rolling stock and airplanes).			
Typical terms	Amounts available	Cost of money	Term	Structure
	$100 million	Federal Funds Rate + 2% to 7%	Typically 20 to 25 years	Usually requires 20% initial payment, level principal, and interest payments over the term
Extent of financing potential	The amount that can be raised through equipment trust certificates depends in part on the creditworthiness of the issuer, the type of equipment acquired, and the extent that the equipment is fungible. Investors do not want to face a high probability of needing to resell the equipment given that they will have to take at least a partial loss on the sale. It is typically a passive investment for the financial institution. Amounts available range from approximately $20 million to $200 million, with the cost of money (interest rate) equivalent to a federal rate plus 2% to 5%. Most equipment trust certificates are long term, in the 25-year range and typically require a sizeable (20%) down payment.			
Implementation costs	The cost of issuing an equipment trust certificate is not high. Issuing documents must be reviewed by legal experts. The issuing company has to be creditworthy and financially stable.			
Case study	In the United States, equipment trust certificates are bonds issued by the railroad to a financing entity (e.g., bank or pension fund). The certificate gives the bondholder the first right to the equipment if scheduled interest and principal are not paid when due. Equipment trust certificates were more popular in the past when investment tax credits could be used by investors. Now they are used to finance new equipment, usually in series (e.g., new freight cars coming off a production line in a numbered series). The equipment must be registered and AAR approved.			
Enabling requirements for success	The most important factors for successful issuance of equipment trust cerificiates are a knowledgeable financial institution or investment group and a creditworthy issuing company.			
U.S. application	Equipment trust certificates were very common for financing rail equipment. The development of leasing, including finance leasing, has reduced their use in recent years, in part because of the need for a large down payment.			

6.6.3 Operating Lease Certificates (Available to Private and Public Companies)

Sector	Freight	Passenger		
	✓	✓		
Type of cost	Capex	Opex		
	✓	✓		
Description	Many rail industry assets have long lives—often 20 to 50 years. As the need for the asset (or the profitability of the traffic which the asset is intended to service) cannot be easily predicted 20 to 50 years in the future, it often makes sense to lease such assets over a shorter term. An operating lease is an instrument that gives a company or authority (the lessee) the use of an asset over a typically short (less than 10 years) period of time in exchange for periodic payments. At the end of the lease term, the lease can be renewed (usually at the then prevailing lease rate for similar assets) or the asset is returned to the lessor. The lessor selects and specifies the assets it will acquire; the lessee has no ownership interest in the asset. Lease payments are recognized as an operating expense and the asset does not appear on the lessee's balance sheet (although there are some discussions about changing this rule in which the value of future lease payments would be recognized on the balance sheet). The investor in the asset accepts the long-term risk of asset ownership while the lessor accepts higher payments for control of the asset during the lease term than the asset might cost if acquired. Leasing is often used to meet peak-period or short-term needs for assets. Although leasing is generally more expensive than acquiring the asset, the lessee avoids the risk that the asset may not be needed in the long term or that some technological or market change makes the existing asset economically obsolete. Because of the risk associated with long-term ownership, leasing companies prefer to acquire common or universally useful assets—generally less-specialized assets are easier to lease to others (e.g., commonly used rolling stock). Highly specialized assets are more often acquired directly or leased through a finance lease. In some cases, suppliers such as rolling stock manufacturers become involved in financing rail investments. The most common cases involve supplier financing of rolling stock (e.g., GE Capital financing investments in locomotives or Bombardier financing passenger rolling stock). Suppliers increasingly provide not only equipment but also maintenance services for that equipment. This usually means that suppliers build maintenance facilities (e.g., workshops, depots, and storage yards) and finance those investments on the basis of a supply and maintenance contract. Supplier financing can be used simply to spread the cost of the purchase or to also leave performance risk with the manufacturer. In the latter case, if equipment fails to perform as expected or costs more to maintain or operate, the supplier bears the risk.			
Typical terms	Amounts available	Cost of money	Term	Structure
	$1 million to $ billions	Varies by asset: Market prices – annual lease usually 10% to 25% of new asset price per year	From 1 to 9 years	Level lease payments over the term of the lease
Extent of financing potential	For common assets (e.g., freight cars, locomotives, and heavy maintenance equipment), the amount of funding is limited only by the market potential of the assets being leased. For example, in recent years, there has been great demand for tank cars for oil movements in the United States and the order backlog for tank cars in 2013 was valued at more than $4 billion. Nearly all of these tank cars will be leased.			

Implementation and operating costs	The cost of entering into a lease is not high. Lease documents must be reviewed by legal experts but many asset leases are similar, so this is not too expensive.
Case studies	Some large leasing companies in North America specialize in leasing freight cars, locomotives, track maintenance machinery, workshop machinery, and other equipment (e.g., trucks, automobiles, and computers). Sale-and-leaseback arrangements are still viable for many assets (including buildings and some facilities). In the passenger industry, locomotives are often leased, as are buildings, station facilities, and office equipment. In the past, cross-border and service leases were used to reduce the cost of new rolling stock to public agencies. Under typical public agency accounting practices, profit and loss is not an important metric and asset depreciation is not as useful as it is to for-profit enterprises. Many techniques were used to sell assets to companies looking for depreciation expenses to offset profits for tax purposes. The U.S. IRS has eliminated most of these depreciation-transfer leasing techniques, but public agencies still lease some equipment where there is an established market. In the United Kingdom, leasing of rolling stock is common for all of the passenger train operating companies. At the time of privatization, because British Rail already had trains running on all the routes and it was not practical to replace them immediately, it was decided to tender the franchises with rolling stock leases in place. Three rolling stock leasing companies (ROSCOs) were established and these took over British Rail's passenger rolling stock, with 5- to 7-year leases in place with the passenger train operating companies. The ROSCOs were then privatized and have since bought more rolling stock. The ROSCOs are essentially providing a banking service to operators, mainly to reduce the capital requirements of operators and to make it easier to change the operator of passenger franchises (i.e., they broke the link between the age of the rolling stock – typically 30 or 50 years – and the life of the franchise – typically 5 to 7 years). But they also manage the long-term ownership, including heavy overhauls and rebuilding in response to changing needs. They are also in a good position to manage rolling stock "cascades," where older trains are transferred to other train operating companies as new trains are brought into service. The ROSCOs invest in rehabilitation and new equipment based on market needs without any government money being spent directly (although the government does influence cascading through the franchise process).
Enabling requirements for success	The most important factor for successful leasing is an observable market with multiple potential lessees. It is difficult to lease highly specialized equipment and fixed assets (e.g., bridges) because the owner has no recourse if the lessee does not meet the terms of the leasing agreement.
U.S. application	The rail leasing market in the United States is large and vibrant. About 50% of all freight cars are leased; 15% of all locomotives are leased; and 95% of commuter equipment is leased. The lease market can be accessed by smaller railroads, which often lease older and less-expensive equipment. Although most wishing to lease rolling stock should have a reasonably good credit rating, given that the equipment being leased provides its own security, a spotless credit rating is not required.

6.6.4 Finance or Capital Leasing (private and public companies)

Sector	Freight	Passenger		
	✓	✓		
Type of cost	Capex	Opex		
	✓	✓		
Description	A finance lease is an instrument that gives the lessee the use of an asset over a long period of time in exchange for periodic payments. It is a long-term lease considered by accounting standards as the economic equivalent of asset ownership. At the end of the lease term, the lessee can acquire the asset at a price agreed at the beginning of the finance lease (usually well below expected market value at the time) or the asset can be turned back to the lessor. Generally, the lessee selects and specifies the asset to be leased. The lessor is often a finance company or bank and has no long-term interest in the asset. The lease term represents a significant proportion of the life of the asset. The lessor is the owner of the asset until the end of the lease. Finance leases generally reduce working capital but increase debt-equity ratios. Both the value of the asset and the liability associated with the finance lease are carried on the books of the lessee. Lease payments are structured as principal and interest, and principal charges are not expensed, but are reflected on the balance sheet as a reduction in the liability associated with the lease. Interest payments are usually recognized as an expense. The lessee is responsible for maintenance and warranty issues. Usually, if the asset is destroyed during the term of the lease, the lessee either replaces the asset with a similar one or pays out the lease. For the most part, finance leases are structured such that the lessee carries the risk associated with ownership of the asset. Amounts available range from $1 million to $ billions, with the cost of money (interest) varying by asset, based on the function price of the asset and length and structure of the lease. The financing term is usually at least 75% of the useful life of the asset. The structure is typically for level lease payments over the term of the lease, with a balloon payment at the end of the term.			
Purpose	A financing mechanism used to acquire capital equipment or facilities with payments spread over the life of the asset			
Typical terms	Amounts available	Cost of money	Term	Structure
	$1 million to $ billions	Varies by asset: Payments are a function of the price of the asset, the length of the lease, and the structure of the lease	At least 75% of the useful life of the asset	Level lease payments over the term of the lease with a balloon payment at the end of the term
Extent of financing potential	Finance leases depend on the creditworthiness of the lessee and can be used to finance many different types of assets.			
Implementation and operating costs	The cost of entering into a finance lease is not high. Lease documents must be reviewed by legal experts but many asset leases are similar, so this is not too expensive. The lessee has to be creditworthy and financially stable. A financial institution with experience with equipment finance leases is more likely to enter into such agreements than a local bank.			

Case studies	Most railroads use finance lease arrangements to acquire rolling stock. A finance lease is generally less expensive than an outright lease, but more expensive than buying the asset outright. Finance leases are used to create additional leverage on the balance sheet.
Enabling requirements for success	The most important factor for successful finance leasing is a creditworthy lessee. A finance lease can be used to acquire specialized equipment.
U.S. application	The railway finance leasing market in the United States is large and well developed for both freight and passenger equipment. No significant barriers to the use of this type of financing exist in the United States.

6.6.5 Bonds with Public-Sector Backing

Sector	Freight		Passenger	
			✓	
Type of cost	Capex		Opex	
	✓			
Description	A bond is a form of debt whereby an entity issues (sells) a bond to a lender and is then obliged to pay them a fixed-interest rate (coupon) and/or repay the principal at a set maturity date. Bonds issued by public entities in the United States (e.g., local, state, and federal governments) include general obligation bonds and general revenue bonds, both of which encompass municipal bonds (issued by municipal governments). In the United States, interest income received by holders of municipal bonds is often exempt from federal tax and is sometimes exempt from state income tax. Because of this exemption, municipal bonds typically pay lower interest rates than non-exempt bonds. General obligation bonds are attractive to investors because of the government-backed certainty of payment. This security is in contrast to general revenue bonds where repayment is based on future revenues generated by a project and where, if the project does not raise sufficient revenue, there is the possibility of default. For example, toll road revenue may be pledged to pay for the bonds and if tolls are not realized to the extent predicted, there may be challenges in repayment. These types of bonds carry more risk because they depend on demand for the facilities. In recent years, several toll roads have underperformed traffic expectations and financing has had to be restructured. Because of the somewhat higher risk, revenue bonds generally have higher interest rates than general obligation bonds.			
Purpose	Can be used for any approved investment project			
Typical terms	Amounts available	Cost of money	Term	Structure
	$15 million to $ billions	Federal Rate +2 to +5%; interest not taxable to recipients	10 to 30 years	No grace, level payments
Extent of financing potential	The financing potential of general obligation and municipal bonds is limited by the credit rating of the authority or issuer, by the type of bond issued, and often by statute.			

Implementation and operating costs	It is not expensive to issue government-backed bonds, but political costs may be higher. For example, municipal bonds must be authorized by a state or local government and, depending on the type of bond, such authorization must be balanced with other funding requirements and with the credit rating of the issuing or guaranteeing body. There are many different types of municipal bonds, depending on the source of funding used to make required principal and interest payments on the bonds. Generally, the most secure municipal bonds are "full-faith-and-credit" bonds wherein scheduled payments are guaranteed by the issuer (e.g., authority, local government, and state government). These bonds are the least expensive and usually carry an interest rate that is usually about 25% to 30% below prime rate (and usually somewhat higher than federal treasury bonds of similar duration). The actual rate depends on the size of the bond offering and the credit rating of the authority issuing the bonds. A few local governmental jurisdictions have gone bankrupt in recent years; this increased the cost of municipal bonds and has prohibited some authorities from issuing bonds altogether. Property assessment bonds promise repayment from increases in property tax receipts. These bonds are usually used to finance local redevelopment projects, which sometimes include transport facilities. These bonds usually have higher risks than revenue bonds because they depend on action-at-a-distance—increases in property values from the development projects. They, too, have higher interest costs than "full-faith-and-credit" bonds.
Case study	General obligation bonds are used extensively by U.S. states and municipalities to raise finance for public works projects and are backed by government guarantee. These are the largest financing mechanism available to public authorities and municipal governments. Municipal bonds are used to provide most public infrastructure, even when federal and state grants are also used. Municipal bonds fund investments in community redevelopment, regional and local hospitals, schools, stadiums, water systems, roads, and transit systems. California has used general obligation bond finance to secure private-sector investment for its HSR development efforts. In 2008, voters in California approved by ballot the establishment of the Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century. The law allocates $9.95 billion to the California High-Speed Rail Authority, of which $9 billion is allocated to construct core segments of the HSR project from San Francisco to Los Angeles. If all legal challenges can be resolved, the money will be raised through general obligation bonds that will be paid off over a period of 30 years. (Source: California HSR Authority. www.hsr.ca.gov). The U.S. federal government has also supported issuance of local bonds for many public infrastructure projects, by making the terms of bonds more favorable to the market (e.g., through the Build America Bonds [BAB] program). The program was an opportunity for states and local governments to raise additional private finance for transportation (and other infrastructure) projects. Traditionally, state and municipal agencies issue tax-free bonds to raise finance, which offer a lower interest rate than market rate bonds. When the financial crisis hit, such agencies were increasingly struggling to find buyers for non-taxable bonds, especially foreign buyers who are not interested in tax-exempt bonds because they do not reap the advantages anyway. The BAB program—established under the ARRA in 2009—enabled municipalities to issue taxable bonds by providing support to two types of product: Tax Credit BABs provided a federal subsidy as a refundable tax credit directly to bondholders, while Direct Payment BABs provided a federal subsidy of 35% on the interest paid on the bonds to the issuer. The program successfully broadened the market for municipal bonds to include investors who do not normally hold tax-exempt debt (e.g., pension funds and sovereign wealth funds). In the first year of the program, over $106 billion of BABs were issued by state and local governments across 49 states, the District of Columbia, and two territories. The program was cut after 2 years (expiring on December 31, 2010), further highlighting the importance of securing support from the federal government for major infrastructure projects. Source: Website: www.treasury.gov/initiatives/recovery/Pages/babs.aspx (As of May 15, 2013). Efforts to reinstate the program failed.

Enabling requirements for success	Municipalities or state authorities (e.g., development, transport, and port authorities, sanitation districts, and environmental districts) must be duly authorized by superior governmental units that have bonding authority. Ultimately, state governments give various in-state public entities the authority to issue municipal bonds and almost always specify the type. In addition, credit agencies have to issue a credit rating. Finally bonds must be legally drawn and issued by licensed sellers. One of the challenges with municipal bonds is that tax exemption does not appeal to all lenders. Tax exemption is an implicit subsidy (relative to taxable corporate bonds) taken into consideration when investors price bonds. Entities not seeking a tax exemption—non-profits, federal government, pension funds, or international lenders—do not enter this market.[68]
U.S. application	General obligation bonds and municipal bonds are the predominant form of financing public investment in the United States.

6.6.6 Corporate Bonds (available for private entities)

Sector	Freight		Passenger	
	✓			
Type of cost	Capex		Opex	
	✓			
Description	A corporate bond is a long-term debt obligation (generally with a term more than 1 year) issued by a corporation. Corporate bonds can be secured by some real property (e.g., a mortgage bond secured by land or property; an equipment bond secured by rolling stock or other equipment) and usually pays a periodic interest rate until the bond reaches maturity when it is redeemed or bought back, usually at face value. Some bonds are not secured by property but by a claim on the assets of the corporation (e.g., secured by its balance sheet)—these non-secured bonds are typically called debentures. Senior bonds give bondholders first call on company assets (ahead of other creditors and shareholders). Subordinated debt has a lower call on corporate assets should a company default on the payments. Corporate bonds generally receive credit ratings (e.g., AA, BBB) from rating agencies. Interest rates paid on corporate bonds vary by exposure to risk, with more secure bonds (e.g., secured, senior, and those issued by companies with high credit ratings) paying lower interest rates and other, more risky debt paying higher interest. Interest payments from corporate debt are not tax exempt.			
Purpose	Railway enterprises generally issue (sell) corporate debt instruments (bonds) to raise capital for investment projects, although unsecured debt can be used for any purpose. Bonds are an alternative to selling stock and are generally considered cheaper. Rail corporations typically try to maintain a debt-equity ratio of between 50% and 65%. Higher debt relative to shareholder equity generally results in lower credit ratings and more costly debt (in which case, rail corporations would have to pay higher interest rates to raise funds).			
Typical terms	Amounts available	Cost of money	Term	Structure
	$25 million to $ billions	Federal Rate +1% to +5%; interest taxable to recipients	Usually 7 to 100 years	Interest payments to maturity, then balloon payout of principal

[68] Kahn, M. E., and David Levinson. "Fix It First, Expand It Second, Reward It Third: A New Strategy for America's Highways." The Hamilton Project (Brookings Institution), Discussion Paper 2011-03, February 2011.

Extent of financing potential	Railroads can raise up to 100% of shareholder equity through bonds (e.g., CSX, a Class I railway, has a total debt-to-equity ratio of about 100%; UP, also a Class I, is about 45%). CSX has shareholder equity of about $9 billion; UP about $20 billion.
Implementation and operating costs	The costs to issue corporate bonds (including legal fees, registration, credit review, and issuance costs) are high enough that most corporations try to issue bonds in multi-million dollar increments—$50 million to $100 million increments. Smaller railroads may issue corporate debt to local banks, but will pay many of the same fees. A relationship with a banker or fund manager can help keep the cost of issuing and managing corporate debt low.
Case studies	Many railroad bonds are traded on national markets and all major North American railroads have bonds on the market now. In recent years, some railroads have issued "Century Bonds" that have a term of 100 years. For example, Norfolk Southern, a Class I railroad, issued $250 million in 100-year bonds in 2010 at a cost of about 5.95%; it also sold $500 million in 100-year bonds in 2005 that carried a 6% interest rate. CSX issued $300 million in 31-year bonds in 2012 with an interest rate of 4.5%. Smaller railroads raise capital by direct placement of debt with banks and financial institutions. These are typically not corporate bonds but short-term debt obligations that carry much higher interest rates and may have restrictive covenants that limit other debt or place restrictions on how capital is used and when it must be repaid.
Enabling requirements for success	Generally, corporate bond sales are limited to large corporations with a long credit history and good credit ratings. Bond issuance requires legal preparation, approval of the board of directors and, under some conditions, approval of shareholders and other debt holders.
U.S. application	This is the predominant form of financing used by large freight railroads in the United States.

6.6.7 Mezzanine Financing (available to both private and public companies/authorities)

Sector	Freight		Passenger	
	✓		✓	
Type of cost	Capex		Opex	
	✓		✓	
Description	Mezzanine financing is more expensive than secured debt or corporate bond financing. Mezzanine financing is usually secured in some way (by potential ownership interest or warrants for shares of the company).			
Purpose	Mezzanine financing, a kind of middle-level financing, is usually used for a specific purpose until longer term financing can be arranged. Specific purposes include acquisitions or to finance a major construction project in process (e.g., building a new railway line, terminal or structure or acquiring land for a future investment project).			
Typical terms	Amounts available	Cost of money	Term	Structure
	$100s of millions for large railroads; $10 million to $100 million for smaller ones	Prime; Prime +1-5%	5 to 7 years typically	Initial cash payment, then cash interest with a balloon payment

Extent of financing potential	Funding potential depends on the size and creditworthiness of the company. Most railroads seek to reduce mezzanine financing because it is more expensive than longer term debt. Typically would be less than 10% of the equity value of the company.
Implementation and operating costs	Mezzanine financing usually requires a cash payment up front and interest during the term of the financing and often requires the pledge of some security (e.g., preferred stock).
Case studies	Most railways use mezzanine financing for major capital projects.
Enabling requirements for success	Legal instruments related to the financing and the assets pledged (may require an appraisal or that the company secure approval of shareholders). Companies will need to be creditworthy, have an investment or purpose for the funds that appeals to investors, and good prospects for increased earnings.
U.S. application	Most major North American railroads use forms of mezzanine financing at times.

6.6.8 Short-Term Corporate Line-of-Credit Financing

Sector	Freight		Passenger	
	✓			
Type of cost	Capex		Opex	
	✓		✓	
Description	Railroad companies usually have access to commercial line-of-credit financing for short-term credit needs. Typically issued by banks or other financial institutions, such financing can be structured for very short terms (weeks to months) to as much as 5 years. Line-of-credit terms are typically non-secured (and expensive), although there are many forms of secured credit (e.g., receivables or owned assets can be pledged). The railway usually pays for the line of credit (typically as a percentage charge on the maximum amount that can be borrowed under the line-of-credit agreement).			
Purpose	Typical use is for cash flow to cover lumpy investment or opex spending patterns. Short-term financing is used to address liquidity issues that arise from time to time for most railways. The railway company can use the line of credit for any purpose and pays interest on the amount borrowed.			
Typical terms	Amounts available	Cost of money	Term	Structure
	$20 million to $100 million	Prime rate to prime rate +5%; initiation charge	1 year	Short-term financing, usually with interest and a balloon payment
Extent of financing potential	Funding potential depends on the cash flow and credit rating of the railway. Collateralized line of credit or on-demand financing can be somewhat less expensive.			
Implementation and operating costs	Short-term corporate financing is the most expensive type of credit for railroad companies. The company pays a fee to establish the line of credit—usually the fee is a percentage of the total amount that can be called on. A line of credit that represents a significant proportion of free cash flow is more expensive than a smaller line of credit. The company seeking short-term financing or a line of credit has to be creditworthy and financially stable.			

Case studies	Short-term financing is used when a railroad has a short-term liquidity issue, which might arise from the need to make a large cash investment or cover the cost of higher maintenance expenses during a low-traffic period, a work stoppage at the railway or at a major customer, or for any other reason.
Enabling requirements for success	Most important factors for short-term financing are a knowledgeable financial institution and a creditworthy company.
U.S. application	All railroad companies have short-term financing arrangements with local banks and financial institutions.

6.6.9 Sale of Stock (Ownership Stake)

Sector	Freight	Passenger		
	✓	✓		
Type of cost	Capex	Opex		
	✓	✓		
Description	Railroad companies can issue common stock in public offerings through stock exchange-related financial institutions. Common stock entitles the owner to share in company profits, usually paid as dividends. Common stockholders can influence company policy by voting on company objectives, stock splits, issuance of additional company stock and by electing the company's board of directors. Shareholders expect to earn a return from dividend payments or through price appreciation (increasing value of common stock). Returns to common stockholders are uncertain given that dividends are not guaranteed. Common stockholders are particularly vulnerable in bankruptcy proceedings because common stockholders are usually the last to receive any proceeds from asset sales and liquidation. However, common stock has performed better than many other financial investments over a long period of time. The issuance of new shares of common stock must be explicitly authorized by a vote of existing shareholders.			
Typical terms	Amounts Available	Cost of money	Term	Structure
	$100s of millions for large railroads; $10 million to 100 million for smaller ones	Considered to be in the 12% to 20% range	No term	Stock sale results in immediate cash
Extent of financing potential	Funding potential from the issuance of new common stock depends on the size of the company and the willingness of shareholders to authorize the creation of new stock. Issuing new stock dilutes the value of existing shares unless the stock is to be used to change the underlying value of the entire enterprise (e.g., for an acquisition that will be additive to value). Except in an initial public offering, the value of common stock is set by market forces. If a stock is selling for $10 and the company issues new shares equivalent to, say, 20% of existing shares outstanding, the value of all stock would be expected to decline to $8, representing the dilution.			

Implementation and operating costs	Issuance of common stock requires a vote of the shareholders. Additional reporting and registration requirements also must be met. The company usually pays a fee to a stock exchange company to handle the share sales.
Case studies	All large railroads in North America are shareholder-owned enterprises. Many smaller railroads are also shareholder owned, and some are closely held by family or major investors (e.g., Berkshire Hathaway owns most of the common shares of BNSF).
Enabling requirements for success	To issue new shares, most companies will need to be creditworthy and have a strategy that appeals to shareholders as well as good prospects for increased earnings.
U.S. application	Most North American freight railroads are shareholder owned. Acquisition of a controlling interest in a registered railroad company must be approved by the U.S. STB and by the SEC.

6.6.10 Tax/Investment Credits

Sector	Freight	Passenger		
	✓			
Type of cost	Capex	Opex		
	✓			
Description	A tax credit is an amount deducted from the total amount a taxpaying individual or company owes to the government. Governments worldwide grant tax credits for various reasons, including acting as a type of subsidy (incentive) to encourage investment in specified property or operations.			
Purpose	Can be used for any approved purpose.			
Typical terms	Amounts available	Cost of money	Term	Structure
	Depends on legislation establishing the tax credit	Investment tax credits reduce tax liabilities for commercial companies	Usually no term	Immediate tax credit; depending on the legislation, can be carried forward to offset future tax liabilities
Extent of financing potential	Varies significantly on a case-by-case basis.			
Implementation and operating costs	Administrative costs are associated with establishing a tax investment credit program. The benefits of any tax credit program (greater investment) need to be weighed against the cost of lost revenues (taxes), taking into consideration the anticipated public benefits and rationale for the credit.			

Case study	Although not common, tax credit programs do exist in the United States to help support freight rail projects. At the federal level, although it recently expired (December 31, 2013), an example is the Railroad Track Maintenance Tax Credit (45G Tax Credit), which is specifically targeted to short-line railroads and can provide a tax credit amount up to 50% or $3,500 per mile of eligible track maintenance and improvement expenditures. At the state level, an example is Minnesota's Tax Credit Program, which provides an income tax credit for 25% of the annual amount spent on track capacity expansion, and a Maintenance Tax Credit, which could offset up to 10% of costs for short-line rail improvements to track and structures to accommodate standard 286,000 lb. train cars. A 2011 report by the AASHTO Center for Excellence in Project Finance[69] highlighted the potential for a tax credit approach for bondholders investing in surface transportation infrastructure through tax credit bonds. Such tax credit bonds could reduce the project sponsor's borrowing cost by a federal government subsidy of all or a portion of interest expense (for projects exhibiting certain public benefits). In lieu of cash interest payments, the investor (bondholder) would receive annual federal tax credits that could be used to offset other federal tax liability. The report noted that, although such programs do not exist for surface transportation, they are in place for forestry conservation, renewable energy projects, energy conservation, qualified zone academies, and new school construction.
Enabling requirements for success	A tax credit program is only beneficial if it can provide incentive for investment that would otherwise not happen. In other words, a tax credit program requires an otherwise attractive investment opportunity, all else being equal.
U.S. application	The U.S. system permits tax credits across a number of jurisdictions for a wide range of reasons.

[69] AASHTO Center for Excellence in Project Finance, "Conference Report: The forum on Funding and Financing Solutions for Surface Transportation in the Coming Decade," January 2011 (Conference held on September 30, 2010). http://www.transportation-finance.org/pdf/featured_documents/sep_30_report_final_2011_02_02.pdf (accessed January 10, 2014).

CHAPTER 7

Case Studies: Potential Application of Alternative Funding and Financing Mechanisms

7.1 Case Study Approach

To illustrate how alternative financing and revenue mechanisms could be used in practice, the research team assessed the potential application of these alternative mechanisms on five case studies for U.S. rail projects in planning or early development stages, and all with a funding gap.[70]

- California High-Speed Rail (High-Speed Rail)
- Amtrak Virginia (I-81/US-29 Corridor) (Intercity Passenger Rail)
- Virginia Rail Express (Commuter Service)
- Chicago CREATE (Shared Corridor)
- New Orleans Rail Gateway (Shared Corridor)

This chapter summarizes the key lessons from these case studies. Full case studies are provided in Appendix E.

Case Study Method

For each project, the research team researched publicly available information from online sources and industry publications. The researchers then identified, at a preliminary level, where potential gaps for funding exist along with potential solutions. The research team then reached out to stakeholders involved in each project (e.g., project sponsor, key government departments, and prospective funding partners) to get additional information on the project.

For each project reviewed the research team sought to answer the following questions, using a case study format:

- **Project Overview:** What is the background/history of the project and the rationale for investment? What information is known about traffic/ridership levels?

[70] The research team's approach in selecting projects was to first ensure inclusion of at least one project per rail sector (i.e., commuter, regular intercity, HSR intercity, and freight/shared corridor). Thereafter, the research team sought projects that have a funding gap. The extent of public information available was also a determining factor in project selection.

- **Funding Requirements:** How large is the project? How are costs broken down (insofar as known)? What other factors will influence cost?
- **Anticipated/Suggested Funding/Financing Model:** What is the anticipated approach to funding/financing the project (e.g., public, private, PPP)? Who is lined up to provide funding? Is there a funding gap?
- **Potential for Alternative Funding and Financing Mechanisms:** Which of the alternative funding and financing mechanisms identified in NCRRP Project 07-01 would be suitable for use in the project? What are some of the opportunities and barriers to using the models?

7.2 Lessons on Application of Alternative Financing and Revenue Mechanisms

The five case studies provide examples of very different projects but many of the lessons on applying alternative financing and revenue mechanisms are similar:

- If a project has a funding gap after seeking all other available sources of revenue, public funding will be needed if the project is to be feasible.
- Private financing is not a solution to a funding gap. It is not possible when there is insufficient funding.
- Public revenue (funding) mechanisms can raise significantly more money to pay for rail projects than revenue mechanisms relating to the rail project or rail assets and services themselves—but there are more barriers (often political) to obtaining such funding.
- In most cases, it will be necessary to draw on multiple sources of funding, many of which are underutilized or not utilized at all.
- The types of projects differ. For commuter rail, public funding through local specific taxation has the highest potential for funding because it is most likely to attract local political support.

For more expensive passenger rail projects like high-speed rail, local specific funding has more limited application because it is difficult to "ring-fence" a project and raise revenue from those who gain from the project (other than the passengers themselves). Such projects must have broader political support for general tax funding.

For passenger projects, general taxation offers the greatest funding potential. The Virginia case study demonstrates the importance of the political will of the state to fund and develop the skills to initiate projects and to obtain federal funding.

There are also transport and other differences among jurisdictions. Virginia is close to Washington, D.C., with significant congestion. In Chicago, rail is important and visible. In Louisiana, there is little rail passenger use. In California, there is only moderate use of rail by passengers. Significant differences in the ability of the states to increase taxes or increase state debt are partly political and partly arise from different perceptions of appropriate uses for public funds.

CHAPTER 8

Beyond Revenue and Financing Mechanisms: Opportunities and Potential Strategies to Realize Rail Projects with a Funding Gap

This chapter provides a discussion of opportunities and potential strategies—beyond mechanisms for funding and financing rail projects and services—to realize rail projects and services. The options discussed in this chapter are provided for consideration and debate and should not be construed as recommendations.

8.1 Measuring Public Benefits, Policy, and Funding for Rail Projects

8.1.1 Context

This research project focused on alternative funding and financing mechanisms that can be used to eliminate the funding gap on rail projects and services. In other words, it addresses the question—how to fund and finance rail projects? The key question is—why should the public sector fund rail projects that have a funding gap? This is the same question that must be addressed when providing public funding to any infrastructure project or service, including, for example, highways or transit systems. This is largely a policy question and is outside the scope of the present research project. It is nevertheless appropriate to consider this question as it relates to the identification and use of public funding mechanisms and resources to realize rail projects that would not otherwise be realized without public funding support, in one form or another.

Fundamentally, there are two related considerations:

- First, when are benefits sufficient to justify the use of public funding for rail projects?
- Second, what kind of policies can help promote the full benefits (or reduction of external costs) and financial feasibility of rail projects?

The first consideration is largely an economic one, necessitating a benefit-cost analysis. The second consideration is about broader transport policy.

8.1.2 Challenge

In the current U.S. context, both considerations above could be better and more systematically addressed. There is a need to more fully evaluate (1) the range of benefits and costs of rail projects and service to support public funding decisions and (2) policies to support and guide public funding for rail projects and services.

Need for a Better, More Systematic Basis for Assessing Rail Project Benefits

Benefit-cost analysis (BCA)—comparing a project's total benefits to society to the total cost of the project—is a standard approach for assessing the public merits of a project. Generally, if the project has a benefit-cost ratio of greater than one, this is one indication of a public-sector rationale for providing funding support for the project.

Financial Analysis vs. Benefit-Cost Analysis

Most private-sector investors assess investments on the basis of a financial analysis rather than a benefit-cost analysis. A financial analysis takes into account only the costs and revenues of a project accruing to its proponent (also called "internal" costs and benefits, because they are internal to the project). Although a financial analysis is essential to establish the commercial viability of a project, it does not take into account the non-market (also called "external") benefits of the project (e.g., reduction in pollution and accidents) that accrue to society. Although some benefits may not be quantifiable, they can be considered in the context of benefit-cost analysis.

In a financial analysis, a project's revenues and costs can be quantified relatively easily, given a set of assumptions, probabilities, and related scenarios, because both revenues and costs are inherently quantitative and comparable values. In a BCA, it can be much more challenging to quantify a project's benefits and compare these to the project's costs because these benefits are often not defined in terms of dollar value. Benefits relating to reduced emissions, improved productivity, and reduced vehicle accidents, for example, require a set of assumptions to convert what are qualitative or otherwise not dollar-value benefits, to a monetary value. This can be subjective. It is also challenging to effectively capture the full range of a project's benefits, because many may be knock-on or longer term benefits.

No Standard Approach to Evaluating Benefits in the United States

In the United States, different agencies and jurisdictions use different approaches and definitions in their assessments of a project's benefits. This complicates the process of benefit-cost analysis when more than one agency, jurisdiction, or funder is involved, which is common for rail projects. In the United Kingdom, in contrast, there is a widely accepted approach to evaluating rail project benefits.

In the U.S. context, rail project benefits are sometimes calculated on a benefit-per-rider basis, whereby a project's total benefits become a function of the total expected ridership. This likely oversimplifies the benefits used in a rail project's BCA. Also, that ridership forecasts are

typically highly speculative can devalue the significance of the project's calculated potential benefits. A more robust, consistent, and systematic framework is needed for assessing the full potential benefits of rail projects. This could help bolster the public funding justification for rail projects, where the project public benefits are demonstrably significant in relation to the project's costs.

In the United Kingdom, for example, where rail's main role is to provide passenger services, which are partly specified and usually funded by the public sector, rail projects must be assessed using a very detailed set of recommendations for the values passengers attach to different improvements. These are published by the Association of (Passenger) Train Operating Companies (ATOC) with access available on payment of subscription. The UK government also publishes detailed guidance on appraisal for all transport investment projects that aim to ensure that projects for all modes are assessed on the same basis; this is broadly followed by devolved bodies (ranging from nations such as Scotland to local government bodies) and gives clarity to those seeking funding. Both these sets of guidance are based on extensive research that is under permanent review. The current discussions about High Speed 2, a proposed $80 billion project between London and the north of England, have led to extensive debate about this guidance.

Need to Anchor Public Funding for Rail Projects to Public Policy Objectives

A positive BCA is not, on its own, sufficient to justify public funding for a rail project. Other material considerations include availability of funding and competing funding priorities (which likely include other opportunities to invest in projects that will generate a positive benefit-cost ratio).

How to best allocate scarce public funding should be guided by public policy and policy objectives. Public funding decisions for rail projects should similarly be supported by a clear policy rationale—i.e., what is to be achieved from providing public support for a rail project, and how does this advance government policy?

Unfortunately, public funding considerations for rail projects are sometimes assessed in the absence of supporting policies, or assessed within a rail funding silo, independent of broader overarching transport policies and public policy goals. If there is no explicit and agreed policy rationale that answers "why fund rail projects," then it is more difficult to justify public funding. It also makes the process of allocating funding to rail projects vs. other, non-rail-related funding needs (e.g., highways) more difficult (and politicized).

A clear policy could help justify the use of specific revenue-generating mechanisms that have the dual effect of causing changes in behavior that support specific policy outcomes (e.g., modal shift from road to rail to reduce road congestion and wear and tear on roads), while raising revenue that can be used to fund the rail project. Such revenue mechanisms could also be used to internalize the cost of externalities generated from non-rail modes of transport.

8.1.3 Potential Solutions

A more robust and standardized framework, method, and set of indicators for capturing and quantifying the full range of rail project benefits could improve future assessments of overall benefit-cost of rail projects. Such a framework and related resources should be supported by credible, evidence-based research of the actual long-term benefits of rail projects (too often a project's benefits are assessed only before a project—it would be relevant to assess actual benefits ex-post to inform future BCA).

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8.2 Establishing a Stable, Predictable Funding Source for Passenger Rail

8.2.1 Context

Railroads require long-term infrastructure assets, which in turn require long-term funding and financing solutions to ensure sustainability. Major investments are typically required during planning and construction, followed by lumpy investments throughout the life of the railroad to ensure service levels and safety are maintained (e.g., track upgrading, rolling stock upgrades, and technology improvements).

Freight rail financing in the United States typically works well on a market (commercial) basis and does not require public funding support with the exception of some joint projects (e.g., CREATE, Alameda, NORG) and some regional short lines. However, the challenge is that, with few exceptions, new and expanded passenger rail services cannot be financed entirely through market-based approaches. Most passenger railroads cannot cover their capital and operating costs from internally generated revenues, and public funding support (based on net public benefits) is required. Nevertheless, given the long-term nature of rail infrastructure investment and ongoing operations, access to long-term funding sources is critical for efficient planning and programming.

8.2.2 Challenge

Notwithstanding many existing federal and state capital grant programs in the United States, public funding for passenger rail operations is generally appropriated annually. No dedicated, long-term, nationwide funding program exists for passenger rail operations and longer term capital projects in the United States, which makes planning and programming challenging for rail owners and operators. For example, Amtrak has traditionally been able to secure just enough funding from public sources to cover its operating losses and capital expenditures, but such funding is only appropriated annually, with no explicit guarantee of funding on a yearly basis. Similarly, occasional one-off rail funding programs (e.g., U.S. HSRIP) are short-lived, leading to a lack of security in obtaining funding for the long term.

The temporary, annual nature of passenger rail funding makes it nearly impossible to attract private long-term capital to these projects—someone has to guarantee the funding before private investors can be attracted. This lack of long-term security in funding makes passenger rail opportunities less attractive generally to potential private-sector partners, because it increases the risks that the public partner could default on their obligations.

It is unlikely that a private investor would be willing to sign on to a long-term PPP to provide rail service without a long-term and guaranteed funding commitment from the government partner. For example, HSR projects can require 10 years or more to develop (let alone to begin construction), and engaging private partners in such projects in the face of changing political priorities (and associated funding whims) is difficult without a dedicated funding source. Private investors would much prefer to see some kind of stable funding allocated to passenger rail projects in the long term (subject to certain performance requirements, of course).

8.2.3 Potential Solutions

Long-term funding could be addressed by establishing a dedicated transportation trust fund, similar in structure to the HTF (which receives most of its revenues from a portion of gas tax revenues), but multi-modal in nature. This could provide funds to passenger rail projects and services that exhibit strong public benefits, with funding guaranteed year-over-year over the life of the asset, subject to meeting certain requirements and performance obligations.

President Obama recently announced the signing of an executive order creating the Build America Investment Initiative, which, among other things, is intended to modernize national public infrastructure by complementing government funding with private capital, including in the form of PPPs. Long-term stable government funding will be necessary if PPPs are to be viable for passenger rail projects.

One way to increase private-sector investment into rail passenger markets could be to structure the public services as contract services with contract terms related to the term of the investment risk (i.e., a private investor would not invest in equipment with a life of 50 years to service a 2-year operating contract unless there was a viable market for the equipment after the term of the operating contract). So a private investor consortium might bid to build, operate, and maintain railway infrastructure under a 30-year contract (with performance metrics); another private investor consortium might invest in railway rolling stock (especially if it could be standardized to be serviceable across many different operations) with a contract to provide equipment and maintenance services for, say, 15 years. Another private investor might want to operate the services in a shorter term contract—7 to 10 years. In these cases, the contracting party would provide a funding mechanism through a contract payment stream. Using this structure, the private investors could find private finance for their investments. In many places, this type of private/private operation is called a concession—each private investor group bids for the right to provide the services over the term of the contract. Bids would generally be negative bids (i.e., how much the public entity would have to pay over the term of the contract). Contract rights for land development, parking, and fare structures would all go into the determination of the investment group bid. Concessions are discussed more fully in Section 8.7.

The fundamental feature that would enable concessioning is a stable funding source for the contracting entity; without a funding source, private investment will not be attracted to rail projects.

Funding Source Options

Fundamentally, if one cannot raise money on commercial terms from the market (a strong signal that a program would need to be justified on public benefits rather than private benefits), then one either has to increase the size or scope of an existing public program or get a new public program. Two potential options are discussed below.

Increase the Size/Scope of Highway Trust Fund. One option could be to increase the scope of the HTF to add intercity (including high-speed) passenger rail (in addition to commuter and transit rail projects already included within the Mass Transit Account component of the HTF). This option is challenging for several reasons. First, there are no surplus HTF funds available. The HTF (which generates about 90% of its revenues from gas tax) has faced a shortfall in its funding needs since 2008, with the shortfall met through general fund transfers. Second, using HTF funds for passenger rail would lead to significant opposition from citizens and industry stakeholders who use the highway system extensively. Many would view an increase in funding from gas taxes for passenger rail as a cross-subsidization that does not benefit them directly (e.g., people living in rural areas who are not likely to ever be served by a passenger rail service). The allocation of some funds from the HTF to commuter and mass transit starting in 1982 was largely a result of local interests (representatives from large urban centers) who were able to organize in Congress to create an agency (UMTA, now FTA) to bring a series of local needs into a single national focus, generating

some federal assistance. However, this allocation of funding from the HTF to commuter and mass transit was, and still is, a point of concern across many sectors of industry.

It would be possible to give states more flexibility in spending highway (HTF) funding to include passenger rail projects or joint freight/passenger projects such as CREATE and Alameda. As noted above, some passenger rail (commuter and transit) projects can access HTF funding through the Mass Transit Account of the HTF (for capital, not maintenance or operations). It might be useful to expand the flexibility that states have to allocate their highway funds to cover more mass transit and extend to passenger rail services. This will not help unless the basic funding from the HTF is stabilized and increased.

Establish a New Multi-Modal Transportation Trust Fund for Infrastructure and Services. A second option would be to establish a new dedicated fund for transportation infrastructure and services, including (but not limited to) passenger rail. A multi-modal transportation fund works best if revenues to the fund are generated, at least in part, by stakeholders who will stand to benefit from the infrastructure and services in question. When users pay directly for the infrastructure they use, they receive more timely and accurate signals about the range of costs the infrastructure imposes on the system.

By and large, rail passenger transport is valued because it can reduce highway congestion, provide a transport alternative, and/or reduce emissions of pollutants and CO_2. To some extent, safety is also improved with corresponding benefits for lower healthcare costs. Overall, development of a passenger rail system that prices the social, economic, and environmental benefits of passenger rail would contribute to more sustainable development patterns of public infrastructure.

Potential sources of revenues for a dedicated transportation fund might include

- Road tolling/congestion charging: Highway tolling or congestion charging in urban areas with some of the proceeds going to finance the local share of the rail passenger alternative. The logic behind focusing on urban areas is that these areas stand to benefit most from most forms of passenger rail (e.g., commuter rail and HSR/intercity rail which only stops in major cities).
- Distance-based road travel charges: This approach charges drivers based on vehicle miles traveled (VMT) and potentially on factors such as time of day, type of road, vehicle weight, and fuel economy rather than indirectly on fuel consumed. One advantage of a VMT approach is that it can be adjusted to reflect the full cost of a particular section of infrastructure—e.g., it can be higher on a busier urban highway, where a passenger rail service could provide an alternative. However, cost and administrative requirements are associated with implementing this (already proven) technology. There are also some concerns around privacy of a GPS-based system where vehicle movements are constantly being tracked. The VMT option has long been debated as a potential alternative to replace gas taxes in order to replenish the HTF.
- Carbon tax or cap-and-trade programs: Transportation users could be charged for their carbon emissions, with revenues dedicated to support transportation infrastructure investments and operational reforms that produce carbon reduction benefits (including passenger rail).[71] If it can be argued successfully that rail passenger service reduces highway maintenance by getting cars (and trucks) off the road, then some portion of a carbon tax (which could replace fuel taxes) could be allocated to rail passenger (and maybe freight) funding, in this case operating costs as well as capital. However, using all carbon tax receipts for passenger rail funding would likely be unfeasible for the same equity consideration noted above—that some taxpayers would never use these passenger rail projects.

[71] To some extent, fuel taxes are already a good surrogate for carbon emissions.

Some of the options above involve applying a fee to road-based users that would then be partially used toward passenger transportation. Using this type of approach coupling road user charges with passenger rail service is likely to present legal issues, because the service providers (e.g., state highway and municipal government) are almost always different agencies with different jurisdictions and institutional enabling legislations. The same is true for the gas tax. Although the logic of shared revenues is viable in theory, implementation is challenging in the current legal and institutional environment.

The Grow America Act would invest $19 billion over 4 years to, among other things, establish the Current Passenger Rail Service grant program to provide ongoing funding certainty to ensure that existing passenger rail projects and services are maintained in good, working condition. These grants would be oriented around Amtrak's main business lines.

8.3 Multi-Modal Project Grant Funding: TIGER

8.3.1 Context

The era of the massive, single-focus, wholly publicly funded transport megaprojects, such as the Interstate Highway Program, may be over. Instead, for much of the nation's future transportation infrastructure, the emerging model appears to be complexity, with projects touching several modes, involving government at local, state and federal levels, and pursuing benefits (and incurring costs) not solely of transportation efficiency, but also reduced environmental impacts, improved safety, and enhanced urban function, among many others.

8.3.2 Challenge

These new multi-modal projects do not fit well with the prevailing modal funding and organization prevalent within the DOT (e.g., commuter and transit under FTA, intercity passenger rail under FRA, and highways under FHWA). A better way is needed to assemble the various interested parties, provide an umbrella organization under which they can identify a project that serves many objectives, assemble the skills needed to deal with all aspects of the potential project, and crystallize the commitments and investments from all parties involved.

The early experiences of the Alameda Project and CREATE emphasize this point. In both cases, the approach was initially ad hoc, with no background policy or funding to assist. The parties had to develop solutions and search for financing. In the Alameda case, solutions were eventually found. In CREATE, coordination issues have been difficult, and generation and balancing of funding from all parties has taken years and is still not complete.

In response to the economic recovery challenge from the global financial crisis of 2008, the Obama Administration created a transportation funding program that has addressed some of the challenges above head-on: the TIGER discretionary grants program.[72,73] In contrast to other

[72] See http://www.dot.gov/tiger for a description of the TIGER program, the award criteria, and a history of grant projects in prior years.

[73] At the same time, the American Recovery and Reinvestment Act of 2009 (ARRA) was also created. The $750 billion ARRA program covered all areas of the U.S. economy and was aimed at rapidly generating employment. The ARRA program was the source of $8 billion investment in HSR projects, including $3 billion in the California HSR project.

transport funding programs, the TIGER program provides a good model for a multi-modal coordination and funding. TIGER is a discretionary grant program, although it does have an explicit objective to generate an equitable distribution of money over geographical areas and modes. In each year, the Department of Transportation invites competing proposals for TIGER discretionary grants. The award criteria focus on multi-modal projects that are multi-jurisdictional and otherwise challenging. In other words, TIGER aims to promote projects that do not fit well into the traditional DOT stovepipes but may fit the profile of transportation projects of the future.

Since 2009, the TIGER program has provided $3.5 billion to 270 projects.[74] The program has settled into an average annual funding level of around $500 million to $600 million. Requests have far exceeded the available funds, which may have contributed to a tendency toward smaller projects; the average size of a grant has decreased from $29 million in 2009 to $9 million in 2013. Every state has received at least one TIGER grant and 10 states have received one or more grants in every year. TIGER grants have spanned every mode—from bicycles to HSR and from trucking to barges and rail. Despite the goal of tackling multi-jurisdictional issues, the explicitly multi-state projects have declined over the life of the program. The proposed Grow America Act authorizes $5 billion over 4 years for additional TIGER funding.

8.3.3 Potential Solution

TIGER grants are meeting a previously unmet need and addressing a gap in federal funding programs, although the TIGER program has not been without controversy. The decision to use a small, central staff that also has access to the vast range of expertise in the modal administrations has produced a flexible and cost-effective approach. The TIGER evaluation process has encouraged applicants to think across modal and administrative lines in identifying problems, and the central staff/modal expertise approach has permitted the U.S. DOT to respond in kind. Equally important, the discretionary element of TIGER has permitted the Secretary and the Department to use an unusual degree of creativity in project formulation. Because of these attributes, the TIGER program has become an invaluable "bottom-up" source of information about real transportation needs.

The TIGER program is an approach to deal with complex transportation issues (and associated funding requirements). The basic strengths of the program—discretionary allocation; multi-modal focus; multi-jurisdictional coverage; access to technical, institutional, and jurisdictional expertise; and reliance on a wide ranging group of applicants—lead to better and more relevant transportation projects and can foster much-improved feedback among DOT and its clients (and the Congress) as to the types of projects that states and communities really need. In addition to existing programs that focus on well-understood modal needs, TIGER adds a multi-modal vision.

If the TIGER program continues, it could benefit from a stable funding base and be enhanced with added access to some forms of lending authority, or guaranteed lending authority, that already exist within the modes. This could include access by the private sector as well as state and local governments in order to expand the participation of private-sector investors and operators in the TIGER projects. An "Infrastructure Bank" with lending authority alone will not suffice, but, if this can be matched by grants to cover project formulation and to pay for the public benefits realized by projects, PPP will be encouraged. Indeed, TIGER programs could explicitly have the authority to participate in PPP projects ranging from toll-road type projects to concessioning of HSR systems.

[74] See http://www.dot.gov/briefing-room/strong-demand-tiger-grants-highlights-continued-need-transportation-investment

8.4 Establish Model Institutional and Commercial Frameworks for Complex, Multi-Party Corridor Improvement Projects

8.4.1 Context

One of the most difficult obstacles to financing investments for private freight railroads that have significant public benefits is the coordination of various interested parties and the trading off of private ownership rights for potential greater benefits from a joint investment in improved infrastructure. The NORG project is an example of this difficulty. First, all parties agreed that the existing infrastructure was insufficient for projected future traffic and both public and private parties could benefit from improvements designed to provide both public and private benefits. The first problem is to appraise existing costs and dis-benefits (both public and private) and design solutions that can minimize costs and provide sufficient benefits to all parties so as to make a public-private solution worthwhile.

Once a politically and economically feasible project (or set of projects) has been selected, a new set of mechanisms may be needed for implementation. This may include federal and state grant programs along with private investments by the railroads with the overall improvement project slated to be completed in smaller steps over time. A comprehensive and wider ranging set of investments may benefit from the formation of an authority, as in the Alameda Corridor project, to coordinate and finance all the improvements most effectively. This type of solution usually requires coordination of both public and private parties and often requires private companies to contribute assets and ownership rights to a new jointly managed company. The relative values of such contributions need to be reflected in the ownership structure and ultimate cost of the projects. A mechanism to easily coordinate these vital trade-offs is often very difficult to set up.

8.4.2 Challenge

The institutional and commercial frameworks for railway development are unusually complex in the United States[75] and are often major barriers to obtaining funding. There are significant difficulties with the different levels of government and the large number of public bodies that need to be involved—processes need to ensure coordination and leadership on project development, funding, and financing and provide technical guidance on project appraisal.

The early experiences of the Alameda Project and CREATE indicate that the modal organization prevalent within the U.S. DOT makes it difficult to assemble the various interested parties and provide an umbrella organization that can take a project from conception to operation.

One of the most difficult obstacles to financing investments involving private freight railroads that have significant public benefits (e.g., NORG) is the coordination of various interested parties and the trading-off of private ownership rights for potential greater benefits from a joint investment in improved infrastructure. Also freight projects may involve several freight companies and/or terminal operators which, if they all contributed, they might be able to fund the project. However, anti-trust laws often prevent them from communicating with each other directly. A joint enterprise or government authority could act as an intermediary negotiating with each company. Legal changes may be required to make this easier. The government authority could provide seed money if necessary.

Several major rail improvement projects (e.g., Alameda Corridor, CREATE, and NORG) have encompassed large and complicated transactions involving many different parties. The necessity

[75] For example, Germany also has a federal system of government but it has a single national rail infrastructure company. Germany also has hundreds of small, private rail companies, mostly passenger services, but otherwise similar to the US short lines.

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for this has been driven by the complexity of the rail environment in the United States (multiple private railways control most of the existing rail infrastructure except in the largest urban areas where some public rail infrastructure exists) and the similar complexity of the public environment (with cities, counties, suburban cities, public authorities, states, and state authorities). Different approaches have been used to address this complexity. So far, each approach has been unique.

8.4.3 Potential Solution

It could be worthwhile to develop a set of standard practices, based on the examples above, for dealing with the complex U.S. environment. For example, the following could be developed:

- A set of standard or model agreements between railways and various authorities, between railways and other railways, and between local municipal agencies
- Model structures for a project-specific public authority and a joint private enterprise
- A set of common approaches to solving complex rail and freight traffic interactions, including models, survey approaches, and data sources
- A set of common approaches to determining public benefits.

These models could be managed by a multi-disciplinary team from a central resource. The team could include legal support, rail operations and transportation engineering skills, environmental specialists, communications and program development skills, and organization and management specialists. This team could develop the model agreements structures, expand on the CREATE-SPEED approach to environmental approvals, and work as a resource with government and rail companies to help complex rail/road improvement projects progress.

8.5 Create PPP Expertise and Resources Available at the National Level

8.5.1 Context

PPPs are often misconstrued as a way to fund infrastructure projects, including rail projects. PPPs are not a funding mechanism. A PPP can have financing features, but it is more than a financing mechanism—it is a project and service delivery mechanism. Key success factors for PPPs include clear objectives and aligned incentives between the parties; access to skills within public agencies to structure, understand, and negotiate PPP contracts that reflect a realistic and optimum risk allocation between the public and private sector; the interest and financial ability among investors to enter into PPP contracts; the political will to implement a PPP program; and a legal and regulatory regime that supports PPPs (including powers laid down by statute or a legal act to enable a government entity to enter into a PPP agreement with a private party).

PPP projects for major transportation projects tend to be infrequent (e.g., most cities build a greenfield light rail system at most once in a generation). They are also highly complex to structure and procure, requiring specific expertise not widely available across all levels of government. These skills include project finance, financial modeling and engineering, risk management, negotiating with private companies, management and monitoring of long-term contractual arrangements, and assessing value for money using whole-life costing tools (the systematic consideration of all relevant costs and revenues associated with the acquisition and ownership of an asset). PPPs in rail are particularly difficult because the projects are not usually separate from existing railroads and so it is difficult to ring-fence the incremental revenue from the project.

8.5.2 Challenge

Many government agencies have limited knowledge about PPPs and related expertise and resources. PPPs often immediately become adversarial relationships because government procurement is not set up for long-term partnerships in which not all problems can be defined in a contract at the outset and reasonable solutions have to be negotiated along the way.

Another challenge to improving the use of PPPs relates to low levels of communication across jurisdictions from which to build institutional knowledge on experience and lessons to date. Although some rail transport PPPs have taken place in the United States, many have faced challenges in implementation. In an optimal context, the lessons from these challenges would be documented and considered in the planning and implementation of subsequent projects. This is a challenge in the United States, in part due to the sheer size of the country, but also because of the jurisdictional barriers that can inhibit communication across cities, states, and national government project sponsors. What tends to happen is that states and locals involved in PPPs do not share experiences and then they reinvent the wheel each time, with repetitive and costly mistakes.

It is very costly (and often unnecessary) to build long-term skills to structure and procure PPPs across all staff in every government department. Most staff do not need the specific skills and PPP projects in transportation tend to be infrequent, making a major training program redundant quickly (once a project is in place). The exception may be where states anticipate implementing a large PPP program and deem it worthwhile to establish dedicated units at the state level to implement the program. For example, Virginia's Office of Transportation Public-Private Partnerships (OTP3) is responsible for developing and implementing a statewide program for transportation PPP project delivery via the Public-Private Transportation Act (PPTA) of 1995.[76]

8.5.3 Potential Solutions

The United States may benefit from establishing some unit of expertise at the national level and a supporting repository of PPP resources and best practices on the design, procurement, implementation, and management of PPP projects, generally, and rail projects specifically. This would be particularly useful for cities and states in the early stages of considering PPP options for rail projects and/or states and cities that anticipate having relatively few such projects. Over the past decade alone, more than 25 states and national governments worldwide have established PPP units of some sort.[77] Such units provide a wide range of different types of support services, from advising on PPP policy development to contract monitoring support. The rationale for establishing such PPP units has varied, but the three most common arguments supporting formal establishment of PPP units (rather than ad hoc, uncoordinated support initiatives) include[78]

- Having a one-stop center of expertise, where standardized documents can be prepared and disseminated (e.g., RFP, contract templates, and Value for Money assessment tools), which provides guidance to all public agencies and also provides confidence to private-sector parties seeking information and some certainty regarding the approach to implementing and financing PPPs in the country.
- Development of an institutional memory and ability to capture best practice and lessons learned from PPP transactions, which can then improve project preparation and delivery over time.

[76] www.vappta.org

[77] For example in the United Kingdom, a unit within the Treasury works on the UK's long-term infrastructure priorities and secures private-sector investment, mainly through PPPs. It is responsible for coordinating and simplifying the planning and prioritization of investment in UK infrastructure and improving UK infrastructure by achieving greater value for money on infrastructure projects and transitions.

[78] See also: Christine Farrugia, Tim Reynolds, and Ryan J. Orr. "Public-Private Partnership Agencies: A Global Perspective." CRGP Working Paper #0039, August 2008.

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- Benefits of centralizing technical expertise in one unit, staffed with experienced professionals (e.g., financiers, lawyers, and economists) who are well placed to negotiate with, and understand the needs of, the private sector; often establishing an independent unit (arms-length from government) is necessary in order to attract and remunerate these experts above a typical public-sector pay scale.

Build America Transportation Center: Recent Development in Line with Such a Solution

President Obama recently announced the signing of an executive order creating the Build America Investment Initiative. Among other things, this initiative includes the establishment of a Build America Transportation Center, under the oversight of the U.S. DOT. This center will seek to provide information and technical assistance about innovative financing strategies, including PPPs, to state and local governments, among others. Technical assistance to be provided by this center will include information on best practices from states and communities that already have established successful PPPs as well as analytical toolkits.

8.6 Improve Insurance Market for Shared Corridors

8.6.1 Context

All types of railroads need insurance to cover the costs of unforeseen events (e.g., derailments, level-crossing accidents, collisions, and loss of life). Most rail freight companies are self-insuring up to a loss limit; over those limits, insurance covers at least part of any losses and liabilities associated with the unforeseen event. Rail passenger and freight services exhibit three challenges for insurance markets: losses can be very large, the specific cause of the liability can be hard to establish, and the probability of any event occurring is hard to calculate. When freight and passenger operations are fully separated, the insurance market for liability coverage is somewhat more conventional because both liability and exposure are more readily calculable. However, when one type of service (usually passenger) operates as a tenant on the tracks of the other (i.e., a shared corridor), the situation is more complex, particularly with respect to identifying who should take liability for the cause of the accident. The liability associated with passenger services is generally considered to be much higher than for freight services because of the potential for loss of life and personal injury—the United States has a very unpredictable and expensive system for determining these liabilities.

Until 1997, Amtrak and non-Amtrak (commuter) rail operators using freight rail networks were effectively required to indemnify the freight owner against all liabilities, even those caused by errors on the part of the freight owner. In part to address this unbalanced approach, the Amtrak Reform and Accountability Act of 1997 (ARAA) included a provision intended to define and limit the maximum liability of passenger carriers (Amtrak and non-Amtrak) to a total of $200 million per incident or accident. It also included a provision explicitly intended to enable agreements between a carrier and an owner as to allocation of liability.[79]

The liability provisions of ARAA have not been fully successful for several reasons. First, the $200 million limitation for a single accident or incident does not include third-party liability. As a result, even with the $200 million limitation, total liability is still not fully calculable and

[79] Codified as 49 U.S.C. § 28103.

freight railroads need to cover themselves. Next, imposition of an arbitrary limitation on damages has not been fully litigated and may not be acceptable under the U.S. Constitution. Finally, despite the intent of ARAA that Amtrak be able to accept all of the liability of the freight owner, the STB has ruled that transfer of responsibility when the freight carrier is guilty of gross negligence, recklessness, or willful misconduct would not be consistent with good public policy. Non-Amtrak passenger operators (e.g., commuter) have faced additional problems because their lack of mandatory access to freight tracks has meant that agreements and enforcement have been subjected to widely varying state laws. The result of the uncertainty has been a patchwork of agreements specific to individual states and railroad/carrier negotiating positions.

8.6.2 Challenge

There has been a trend by freight railroads to limit or cap their liability where passenger services operate over what are predominantly freight rail lines. Private freight railroads have sought the highest possible coverage and the maximum transfer of liability to non-Amtrak passenger operators whenever possible.[80]

> Freight railroads want to protect their private property and would like very much to be held harmless if there is an accident with passenger train loss of life. Railroads are already liable for damages from freight accidents. A passenger train accident could be even more severe. Even so, most railroads have been able to reach agreements with well-managed private passenger operators and accept much higher costs associated with maintaining a higher safety standard in areas with passenger operations. MARC, VRE, NJT, MBTA and others operate on private rail rights of way without significant problems. In most cases, freight railroads have sought "hold harmless" clauses in regard to passenger liabilities.

This bargaining position and the trend requiring very high liability coverage have been more serious for smaller passenger rail operators and for new operators without a well-established safety record. The net result in the United States is that insurance coverage is costly, is not always available in the desired amounts, and, in the case of tenant operators, subject to ever-increasing requirements for higher coverage limits. In short, it is challenging for passenger rail operators to increase (or obtain new) access to freight rail infrastructure. This has implications for increasing/advancing the development of shared corridors for passenger rail services in the United States.

Many observers have argued that the liability cap provisions in ARAA could be improved by the following:

- Adjusting the cap to explicitly include third-party liability
- Removing any doubt that the intent of the law is to cover all passenger operators, including non-Amtrak operators
- Resolving the conflict on indemnification to clarify what degree of indemnification is consistent with national public policy and clarify, to the degree possible, the boundary between normal mistakes and gross negligence.

[80] See US GAO, "Commuter Rail: Many Factors Influence Liability and Indemnity Provisions, and Options Exist to Facilitate Negotiations," GAO-09-282, Washington, DC February 2009. See also Bing, Alan J., Eric W. Beshers, Megan Chavez, David Simpson, Emmanuel Horowitz and Walter E. Zullig, "NCHRP Report 657: Guidebook for Implementing Passenger Rail Service on Shared Passenger and Freight Corridors," 2010, pages 29–32. These two reports contain an extensive discussion of rail passenger liability issues as of 2010.

Others argue that shifting passenger liability to freight railroads would limit their willingness to agree to allow access to new passenger services. They point out that most freight railroad rights of way are private property, which has a high degree of legal protection, and Amtrak's terms of access are clearly specified in the law, protecting their private property rights.

8.6.3 Potential Solution

There may be a solution to improve the insurance regime to encourage greater prevalence of passenger services on freight railroad infrastructure: the federal (or state) government could intervene in the insurance market to encourage more passenger rail services on third-party tracks. In the United States, the federal government has intervened in two instances to influence the insurance market for services deemed critical to the public:

- Nuclear power plant operators: The potential liability of private operators in the event of a nuclear accident was seen from the beginning of nuclear power to be a major hindrance to the development of the nuclear power industry. The Price-Anderson Nuclear Industries Indemnity Act of 1957 (since renewed several times) establishes a limit to the liability the private operators of nuclear power plants are expected to bear in the case of accidents. In the event of an incident, the federal government bears responsibility for costs incurred above the minimum amount of liability coverage.[81]
- Weapons manufacturers: U.S. Defense Department (DOD) contractors are often required to produce weapons or equipment that could do enormous damage in the event of an accident, thus exposing the supplier to potentially huge and unpredictable risks that cannot be fully insured. Under the provisions of Public Law (PL 85-804)[82] the DOD can require the contractor to obtain a stated level of coverage above which any residual liability is the responsibility of the federal government. The coverage limit is intended to reach a balance between the cost of the insurance and the risk retained by the public, along with satisfying the needs of national defense.[83]

One solution to improving the liability coverage regime for passenger rail in the United States would be to adopt an approach similar to that used in Price-Anderson or PL 85-804. In principle, the limit of $200 million could be extended to a new, higher amount that would include all liability, including third-party damages. The higher amount would be set at the maximum reasonably insurable amount,[84] would be dealt with through a no-fault approach (to resolve the indemnity issue),[85] and would require that all operators have this level of coverage.

Beyond the maximum amount, the federal government would assume the liability, or state governments would assume the liability if they insisted on maintaining their separate legal regimes.[86]

The federal government could in turn seek to offset some of its risk through a mandatory contribution program as in Price-Anderson, but this would certainly raise issues of what each operator

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[81] See http://en.wikipedia.org/wiki/Price%E2%80%93Anderson_Nuclear_Industries_Indemnity_Act, accessed on December 10, 2013.

[82] Codified at 48 CFR 52.250-1. See http://www.law.cornell.edu/cfr/text/48/52.250-1, accessed December 9,2013.

[83] Significantly for rail passenger service, the FRA was allowed to use PL 85-804 to extend liability coverage for the prime contractor (DeLeuw-Cather Parsons, DCP) on the Northeast Corridor Improvement Project for the high-speed Amtrak line from Washington, DC, to Boston, MA. In this case, the potential liability for DCP was so large and so unpredictable that the FRA determined that the DCP liability should be limited to $400 million (for which DCP obtained commercial coverage) beyond which the liability would be carried by the US Government.

[84] This could include a relationship between the mandatory maximum and some measure of operational risk. Larger operators with higher passenger volumes and higher speeds might face a larger cap, new operators might face a larger cap until they can show safe experience, and very small operators with small and slow trains might face smaller caps.

[85] Issues of gross negligence rather than ordinary error would then be adjudicated as criminal rather than liability matters.

[86] States could be encouraged to harmonize their legal regimes by making a portion of FTA funding dependent on establishing uniform liability requirement. This has long been done by FHWA in the Interstate Highway program.

could be required to contribute, given the disparities in the various operations and their risks. Given that creating such pools has been difficult in the past, this would probably be no easier now.

Another potential solution would be a generalized form of Owner Controlled Insurance Program (OCIP), which is generally taken by the property owner but might be taken in rail passenger cases by the government agency funding the rail projects. OCIP generally covers most liability and losses during the construction and operation of a property or service. An umbrella OCIP policy covers general liability, workers' compensation, employers' liability, and similar needs for all contractors/operators/participants involved in a project. This eliminates the need for each participant in the project to get its own insurance coverage and also eliminates the many lawsuits that could arise with different participants and insurance companies trying to parse the blame for a particular loss. An OCIP-type policy can reduce overall cost of insurance for any project greatly and can also include a self-insurance aspect (a different deductible for different participants). This structure is being used in some commuter rail services with the commuter authority purchasing the OCIP. This generally leads to lower bid costs by concession operators because they do not have to provide for insurance coverage (other than normal business insurance coverage).

8.7 Concessions/Funding

For major intercity and HSR investments, financing can be found to the extent there is an income stream that can fund operations, maintenance, renewals, and debt service. Debt service can be reduced with grants if infrastructure is provided from a separate public authority (that has access to public debt financing) or if rolling stock can be leased.

The full income stream for a train operations concession cannot reasonably be based on annual appropriations from some government agency because these cannot be promised or guaranteed for the length of time needed to earn a return on investment. Involving private financing does not solve the funding problem because private debt needs to be repaid from some identifiable and reasonably predictable funding source—it is hard to sell a concession (or a right to operate a service) if there is no assured income stream.[87] Having said that, the public sector's entering into a contract may serve to ring-fence that funding (which was a major improvement brought about by rail franchising in the United Kingdom).

Based partly on European franchising experience, the following may be possible:

- Set up Amtrak (and other) intercity routes for franchising; sell these concessions on the basis of the least-required income support (i.e., funding from subsidies).
- Make the concessions long enough to finance the required improvements that might be needed, possibly with assets owned by other bodies than the franchisee itself (e.g., in the United Kingdom, neither rolling stock nor infrastructure are owned by the franchisee).
- Guarantee the income support required in the best concession bid (subject to meeting performance metrics defined in the concession). For interstate franchises, FRA or a similar agency could be responsible for administering the program. Congress could set the size of the program by determining the division of these additional funds between "investment" and operating support.

In an example of the simplest case, a tour operator might want to provide a very high-quality rail service between Chicago and Seattle, over the Empire Builder franchise across the Pacific Northwest

[87] Except where the concessionaire/investor will get its money out early because they sell the equipment or infrastructure. The danger in this type of structure is the major concession partners resign the partnership after they have received payment for their rolling stock or infrastructure.

and its Big Sky country, including national parks and travel through the Rocky Mountains. The tour operator might team with BNSF and Amtrak to develop a train service designed like an ocean cruise line service, full of amenities and special events. To win the bid for this concession, they might propose a very expensive service that might require little subsidy.

Or, imagine that NS teamed with an operator (e.g., Amtrak, or SNCF) to run the Crescent service (DC to New Orleans). To win the franchise, they might want to offer higher speeds, which would require improvements to NS lines to permit those higher speeds. NS might want to do this to increase the speed of its intermodal trains and to increase the capacity of its main line. Its partner (e.g., SNCF) might want to do this to make money in the long term as an operator of intercity passenger services. There will be many questions about whose crews, labor agreements, and so forth might be used; whether or not an equipment provider (or leasing company) is a member of the consortium; and whether or not to use relatively standardized rolling stock (for lower cost leases). Other questions would arise about how to/who would define the concessions: for example, would the concession be DC to NO, and could CSX put together its own consortium? Or might someone else (e.g., SNCF) try to use both NS and CSX tracks in some mix and have to attract their permission and put together the infrastructure, equipment, and operating plan? Could Amtrak's access rights be transferred to the new concessionaire or might these require new rights?

The whole plan would assume that the insurance problem was resolved on a commercial basis acceptable to the participants (e.g., Amtrak would take out an OCIP policy). One would hope that the lines concessioned would be those that created the highest consumer surplus (combined public and private benefits less costs), although some case could be made for "essential" services. In any event, the total to be committed could be controlled through the funding mechanism.

States, local communities, and even private entities might want to sponsor and operate service franchises that serve their interests. Here, a concern would be how to gain access to private rail infrastructure outside Amtrak's inherent right of access. Funding sources for this might come from the state or local community "share" of the funding mechanism for rail passenger services or state and local communities might vote to increase local vehicle-mile taxes to produce dedicated funding. Another option would be for them to implement some version of the Oregon Plan, congestion charging, or other dedicated source that would be committed to long-term rail service funding.

CHAPTER 9

Conclusions

No silver bullet financing model or truly new and previously unknown source of revenue can be accessed to fully fund and finance rail projects that have a funding gap. This Guidebook identifies alternative funding and financing mechanisms that can be used to realize passenger and freight rail projects and services, where traditional funding sources, on their own, are insufficient.

In general, if projects can be properly structured, there is an abundance of knowledgeable private financing institutions and of private capital ready to invest in rail projects. What is lacking is a way to fund those projects.

This Guidebook identifies other opportunities and strategies for promoting the financial realization of rail projects or services that have a funding gap. However, using these mechanisms and approaches requires careful consideration and hard decisions about how to raise money from the public, allocate scarce public resources to rail projects, and potentially disrupt the status quo in the provision of rail services. Many of these decisions are likely to be politically sensitive. Nevertheless, if the general premise is that a rail project or service is worthwhile and delivers value—a net benefit—then there could be a strong justification for making such hard decisions.

As and when new funding and financing mechanisms are put to use in the United States, further research on their application and results will be important and beneficial and could help disseminate lessons and promote the use of the funding and financing mechanisms that prove to be most effective in realizing rail projects, given different contexts.

Acronyms and Abbreviations

AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
AEI	Automatic Equipment Identification
ARRA	American Recovery and Reinvestment Act
ARTC	Australian Rail Track Corporation
ATOC	Association of (Passenger) Train Operating Companies
AU	Australia
BAB	Build America Bonds
BART	Bay Area Rapid Transit
BCA	Benefit-Cost Analysis
BLS	Bureau of Labor Statistics
BMJD	Bethesda Metro Joint Development
BNSF	Burlington Northern and Santa Fe Railway
BR	British Railways
BRT	Bus Rapid Transit
CA	California
CAPEX	Capital Expenditures
CARB	California Air Resources Board
CCC	Contra Costa Centre
CMAQ	Congestion Mitigation and Air Quality Management
CPCS	Canadian Pacific Consulting Service
CRCP	Critical Rail Corridors Program
CREATE	Chicago Regional Environmental and Transportation Efficiency
CSX	CSX Transportation
CTCO	Chicago Transportation Coordination Office
DART	Dallas Area Rapid Transit
DB	Design-Build
DBF	Design-Build-Finance
DBOM	Design-Build-Operate-Maintain
DBFOM	Design-Build-Finance-Operate-Maintain
DC	District of Columbia
DE	Delaware
DMU	Diesel Multiple Unit
DOD	Department of Defense
DOT	Department of Transportation
EBIT	Earnings Before Income and Tax
EDA	Economic Development Administration
EMU	Electric Multiple Unit

EU	European Union
EWS	English, Welsh and Scottish
FEDP	Federal Economic Development Program
FHWA	Federal Highway Administration
FOC	Freight-Operating Companies
FRA	Federal Railroad Administration
FRIP	Freight Rail Interchange Program
FTA	Federal Transit Administration
GAO	Government Accountability Office
GE	General Electric
GHG	Greenhouse Gases
GPS	Global Positioning System
HGV	Heavy Goods Vehicle (Truck)
HOT	High Occupancy/Toll Lanes
HSIPR	High-Speed Rail Intercity Passenger Rail Program
HSR	High-Speed Rail
HSRA	California High-Speed Rail Authority
HTF	Highway Trust Fund
HVF	Heavy Vehicle Fee
ICC	Interstate Commerce Commission
IOS	Initial Operating Section
IPROC	Intercity Passenger Rail Operating and Capital Fund
IRAP	Industrial Rail Access Program
IRS	Internal Revenue Service
ISTEA	Intermodal Surface Transportation Efficiency Act
JR	Japan Rail
JRTT	Japan Railway Construction, Transport and Technology Agency
km/h	Kilometers Per Hour
LA	Los Angeles
LGCP	Local Grade Crossing Program
LNG	Liquefied Natural Gas
LRFA	Local Rail Freight Assistance Program
LRSA	Local Rail Service Assistance
LTA	Dubai Land Transport Authority
LTD	Lane County Mass Transit District
MCTD	Metropolitan Commuter Transportation District
MCTMT	Metropolitan Commuter Transportation Mobility Tax
METRA	Chicago Metropolitan Rail
mph	Miles Per Hour
MRFL	Montana Rail Freight Loan Program
MTA	Metropolitan Transportation Authority
MTFC	Missouri Transportation Finance Corporation
NCRRP	National Cooperative Rail Research Program
NEAT	Swiss Rail Line
NEC	North-East Corridor
NJ	New Jersey
NORG	New Orleans Rail Gateway
NS	Norfolk Southern Corporation
NTD	National Transit Database
NY	New York
NYC	New York City

NYSE	New York Stock Exchange
O&M	Operations & Maintenance
OCIP	Owner Controlled Insurance Program
ODOT	Ohio Department of Transportation
ODRC	Ohio Department of Rehabilitation and Correction
OPEX	Operating Expenditures
ORR	Office of Rail Regulation
PATCO	Port Authority Transit Corporation
PAYG	Pay As You Go
PNRS	Projects of National and Regional Significance
PPP	Public-Private Partnership
PPTA	Public-Private Transportation Act
PRF	Passenger Rail Fund
PRIIA	Passenger Rail Investment and Improvement Act
QR	Queensland Rail
RAIL	Rail Access Initiative Links Program
RCPP	Rail Corridor Protection Program
RDA	Redevelopment Agency
REF	Rail Enhancement Fund
RFP	Rail Freight Program
RFP	Request for Proposal
RLR	Rail Line Relocation & Improvement Capital Grant Program
ROI	Return on Investment
ROSCOs	Rolling Stock Ownership Companies
RPC	New Orleans Regional Planning Commission
RPP	Rail Preservation Program
RRGCF	Railroad Grade Crossing Fund
RRIF	Railroad Rehabilitation & Improvement Financing
SAD	Special Assessment District
SEC	Securities and Exchange Commission
SEPTA	Southeastern Pennsylvania Transportation Authority
SFMTA	San Francisco Metropolitan Transportation Authority
SIB	State Infrastructure Banks
SNCF	France National Railways
SPEED	Systematic Project Expediting Environmental Decision
SRSIF	State Rail Service Improvement Fund
STAR	State Transportation Assistance Revolving Fund
STB	Surface Transportation Board
SVMT	Saginaw Valley Marine Terminal
SUV	Sport Utility Vehicle
TAP	Transportation Alternatives Program
TIDF	Transit Impact Development Fee
TfL	Transport for London
TIF	Tax Increment Financing
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery
TOC	Train Operating Companies
TOD	Transit-Oriented Development
TriMet	Tri-County Metropolitan Transportation District
UK	United Kingdom

UMTA	Urban Mass Transportation Administration
UP	Union Pacific
US	United States
USRC	Union Station Redevelopment Corporation
VA	Virginia
VAT	Value Added Tax
VIA	VIA Rail Canada
VIFG	German Transport Infrastructure Financing Company
VMT	Vehicle Miles Traveled Tax
VRE	Virginia Rail Express
VT	Versement de Transport
WMATA	Washington Metropolitan Area Transit Authority
WSDOT	Washington State Department of Transportation
YOE	Year of Expenditure

APPENDIX A

U.S. Federal Rail Funding and Financing Programs

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
Community Facilities Loans and Grants	The US Department of Agriculture offers loans, loan guarantees, and grants under its "Community Facilities Loans and Grants" program to develop essential facilities in rural communities, including health, education, transportation, and recreational facilities.	Municipalities, counties, and special-purpose districts, non-profit corporations, and tribal governments.	Loans, loan guarantees, and grants	Development, Capital, Improvement, Debt Financing	Grants: Up to 75%
Congestion Mitigation and Air Quality Management (CMAQ)	The CMAQ program was part of the ISTEA (1991), created to extend funding for transportation and infrastructure development projects that would result in improved air quality benefits. The program was reauthorized, most recently, under the Moving Ahead for Progress in the 21st Century Act (MAP-21) in July 2012; revised Interim Guidance on CMAQ Operating Assistance under MAP-21 was announced in July 2014. Federal CMAQ funds are apportioned annually to each state according to the severity of each state's ozone and CO2 problem. The fund supports projects aimed at relieving traffic congestion and meeting air quality standards set by the federal Clean Air Act. Passenger and freight rail projects that help in air quality improvement and congestion reduction are eligible to access CMAQ funding. Since inception, the program has provided nearly $30 billion to DOTs, metropolitan planning organizations (MPOs), and other sponsors in support of transportation and environment projects. The MAP-21 provides over $2.2 billion per year in CMAQ funding for 2013 and 2014. CMAQ funds are eligible for use on various freight and passenger rail projects, including priority control systems; intermodal facilities; rail infrastructure rehabilitation; new rail sidings and passenger rail facilities, vehicles, and equipment; and operating expenses (new or expanded service).	State, MPOs and Regional Transportation Planning Agencies, PPPs	Grant	Capital, Operating, Planning and Project Development, Workforce Development, Training and Education Activities	80-100%

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
Economic Development Administration Investment Programs	The Economic Development Administration of the Department of Commerce administers two project grants programs: Grants to Public Works and Economic Development Facilities and Economic Adjustment Assistance, intended, respectively, to (1) promote long-term economic development in areas experiencing substantial economic distress and (2) assist states and local communities in bringing about a positive change in the economy, focusing on areas suffering serious economic damage.	State and local governments, economic districts, private, public- and state-controlled educational institutions, federally recognized native American tribal governments, and non-profits	Grant	Strategic Investments, Job Creation and Economic Development Support	50–80%, depending on average per capita income or unemployment rate of the region.
Fixed-Guideway Capital Investment Grants (New Starts)	Also known as New Starts/Small Starts, this program awards grants on a competitive basis for major investments in new and expanded rail, bus rapid transit (BRT), and ferry systems that improve the capacity of the corridor by at least 10% and do "not include project elements designed to maintain a state of good repair." The program is funded at $1.9 billion for FY 2013 and FY 2014 subject to appropriations by Congress.	State and local government agencies, including transit agencies.	Grant	Capital (engineering, and construction), Project Development	New Starts: up to $100 million or 50% of the total project cost Small Starts: Up to $75 million or 80% of total project cost
HSR Corridor Development Program	HSR Corridor Development Program was initially part of the SAFETEA-LU, but since SAFETEA-LU's cessation, has been re-created as a state grant program with an appropriation of $1.5 billion over 5 years, with states required to match 20% of the federal funding. Eligibility for this program is restricted to projects intended to develop federally designated HSR corridors for intercity passenger rail services that may reasonably be expected to reach speeds of at least 110 mph.	State, a group of states, an Interstate Compact, a public agency established by one or more states and having responsibility for providing HSR service, or Amtrak.	Grant	Capital	Up to 80%

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
Projects of National and Regional Significance (PNRS)	PNSR was created as part of SAFETEA-LU to provide grant funds for high-cost projects of national or regional significance. Projects eligible for funding under this program may include any authorized surface transportation project, including freight rail projects. Eligible project activities include development phase activities, right-of-way acquisition, construction, rehabilitation, environmental mitigation, and equipment and operational improvements. Projects must have a total eligible project cost greater than or equal to $500 million, or 75% of the total federal highway funds apportioned to the state in the most recent fiscal year. Federal share for this program is generally 80% of total project cost. Funds are allocated to projects through a competitive evaluation process based on the ability of projects to generate national economic benefits, reduce congestion, improve transportation safety, and produce other benefits. As of October 2012, 26 projects designated in the SAFETEA-LU legislation have a total authorized funding of $1.779 billion. Of the $1.612 billion in funds allocated for projects in the program, $1.315 billion has been obligated (approximately 82%) and only $903 million has been spent (approximately 56%) as of October 2012. Section 1120 of MAP-21 amends Section 1301 of SAFETEA-LU by authorizing an amount of $500 million for Fiscal Year (FY) 2013 to carry out this program and to remain available until expended. At the time of a 2013 Report to Congress on PNRS, required by MAP-21, no funds authorized under MAP-21 had been appropriated.	Single state DOT or a group of state DOTs	Grant	Development, Capital, Rehabilitation, Acquisition, Improvement	Up to 80%

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
Rail Line Relocation & Improvement Capital Grant Program (RLR)	The congress authorized the RLR in 2005 as part of SAFETEA-LU to assist state and local governments in mitigating the adverse effects created by the presence of rail infrastructure. Only states, political subdivisions of states (such as a city or county), and the District of Columbia are eligible for grants under the program. Grants may only be awarded for construction projects that improve the route or structure of a rail line, mitigating the adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life or economic development or involve a lateral or vertical relocation of any portion of the rail line. Congress appropriated a total of $90,104,200 for the program from FY 2008–FY 2011. There will be no subsequent fund outlays because all funds have been awarded.	States, political subdivisions of States (e.g., municipalities, counties), District of Columbia	Grant	Capital	Up to 90%
Railroad Rehabilitation & Repair (Disaster Assistance)[a]	The Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009, provides the Secretary of Transportation with $20 million for necessary expenses to make grants to repair and rehabilitate Class II and Class III railroad infrastructure damaged by hurricanes, floods, and other natural disasters in areas for which the President declared a major disaster under Title IV of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1974. These funds are to remain available until expended and are to be awarded to states on a competitive, case-by-case basis. Under this program, a state may apply for a grant from the DOT's FRA to cover up to 80% of the cost of a project. The grantees must exhaust all other federal and state resources prior to seeking assistance under this program.	State DOTs	Grant	Repair, Rehabilitation	Up to 80%

[a] Special importance for Class II and Class III railroads.

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
Railroad Rehabilitation and Improvement Financing (RRIF)[b]	The RRIF Program extends direct federal loans and loan guarantees to finance development of railroad infrastructure with repayment periods of up to 35 years and interest rates the same as U.S. treasury rates or comparable. Eligible applicants could include railroads, state or local governments, government-sponsored authorities or corporations, and joint ventures with a railroad being at least one of the parties. The range of projects could include acquiring, improving, or rehabilitating intermodal or rail equipment or facilities, refinancing outstanding debt incurred for the purposes listed above, and developing or establishing new intermodal or railroad facilities. The program authorizes the FRA Administrator to provide direct loans and loan guarantees of up to $35 billion, of which, about $7 billion is reserved for projects benefiting freight railroads other than Class I carriers. Since 2009, loan activity has taken place in 26 states for over $1.7 billion, with 72% of loans extended to Class II and Class III railroads.	Railroad companies, state and local governments, government-sponsored authorities and corporations, joint ventures that include at least one railroad, and limited-option freight shippers that intend to construct a new rail connection.	Loan / loan guarantees (at US treasury rate)	Capital, Rehabilitation, Improvement, Refinancing	Up to 100%
Railroad Safety Technology Grants	PRIIA 2008 authorizes appropriation of $1.65 billion for the nation's rail safety program for FY 2009 through FY 2013. Section 105 of the bill requires the implementation of "interoperable" positive train control systems for Class I freight and passenger rail carriers by December 31, 2015, and authorizes $250 million in Railroad Safety Technology Grants to help operators implement the technology. The grants provide up to 80% of total project costs, with priority given to projects that benefit both freight and passenger rail or advance positive train control technology. On November 7, 2013, FRA issued a Notice of Funding Availability of $550,000 for Railroad Safety Technology Grants, with grant applications to be accepted until February 5, 2014.	Passenger and freight railroad carriers, railroad suppliers, and state and local governments.	Grant	Capital	80%

[b] Originally designed specifically to cater to smaller freight railroads (Class II and Class III).

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
Railroad Track Maintenance Tax Credit (45G Tax Credit)[c]	The American Jobs Creation Act of 2004 provides for tax credit amounts to 50% of qualified railroad track maintenance expenditures (e.g., the cost to improve track, bridges, and signals, paid or incurred by Class II or Class III railroad during the taxable year, in order to help regional and short-line railroads fund their infrastructure projects). Legislation was enacted in December 2010 to extend the tax credit program for an additional 2-year period and maintains the credit limitation at $3,500 per mile. The credit expired on December 31, 2013. Representatives and Senators have introduced legislation to extend the Section 45G short-line railroad tax credit.	Class II or Class III railroads, or any person who transports property using the rail facilities of a Class II or Class III railroad or who furnishes railroad-related property or services to a Class II or Class III railroad	Tax credit	Maintenance, Rehabilitation and Improvements	50% or $3,500 per mile
Section 130 Railway-Highway Grade Crossings Program	The Section 130 Highway Railroad Grade Safety Crossing program is jointly administered by FHWA and FRA and provides grants for safety enhancements that improve highway-railroad grade crossings and reduce the number of fatalities, injuries, and crashes. At least half of the Section 130 funds must be used for installation of protective devices at grade crossings (e.g., installation of warning mechanisms, safety signaling equipment, track circuit improvements and interconnections with highway traffic signals). The remainder of the funding can be used for construction projects (e.g., grade separations, sight-distance improvements, geometric improvements, and closing of grade crossings). Funding for FY 2013 and 2014 is $220 million each. Federal funding is available for up to 90% of project costs. All previous eligibilities under 23 USC 130 continue.	State DOTs	Grant	Capital, Training, Education	90–100%

[c] Specifically targeted to Class II and III railroads.

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
State of Good Repair Grants	MAP-21 establishes a new grant program to maintain public transportation systems in a state of good repair. This program replaces the fixed-guideway modernization program. Funding is limited to fixed-guideway systems (including rail, BRT and passenger ferries) and high intensity bus (high intensity bus refers to buses operating in high occupancy vehicle [HOV] lanes). Projects are limited to replacement and rehabilitation, or capital projects required to maintain public transportation systems in a state of good repair. Projects must be included in a transit-asset management plan to receive funding. The allocation of funds is formula based and comprises: (1) the former fixed guideway modernization formula; (2) a new service-based formula; and (3) a new formula for buses on HOV lanes. Authorized funding for this program is $2.1 billion in FY 2013 and $2.2 billion in FY 2014.	State and local government authorities in urbanized areas with Fixed Guideway public transportation facilities operating for at least seven years	Grant	Capital, Rehabilitation, Improvement, Repair	80%
Surface Transportation Program (STP)	STP funds may be used for highway improvements to accommodate rail line operations (e.g., clearances and grade separations) as well as for railroad relocations and consolidations, intermodal terminals, and the acquisition of abandoned railroad right of ways. STP funds are often used by states to supplement the Section 130 grade crossing funds. The federal matching share for these funds is 80%. Estimated amounts of STP are $10 billion in FY 2013 and 10.1 billion in FY 2014.	Metropolitan planning organizations, county lead agencies	Grant	Capital, Planning, Development	80%

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
TIGER Grants	The Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant program provides investment funds to facilitate road, rail, transit, and port projects that have a significant impact on the nation, a region, or a metropolitan area. Congress dedicated $1.5 billion for TIGER I, $600 million for TIGER II, $526.944 million for FY 2011, $500 million for the FY 2012 and III, $500 million for TIGER 2012, and $475 million for the 2013 round of TIGER grants. TIGER's a highly competitive process, with 40% of TIGER projects having a rail component and constituting 29% of TIGER funds. Each project is multimodal, multi-jurisdictional, or otherwise challenging to fund through existing programs. The TIGER program has a rigorous selection process that prioritizes projects with exceptional benefits, exploring ways to deliver projects faster and save on construction costs. So far $161.3 million has been committed to freight rail projects and $166.8 million to passenger rail projects. The FY 2014 Consolidated Act appropriated $600 million, available through September 30, 2016, for National Infrastructure Investments. This appropriation is similar, but not identical, to the appropriation for the “TIGER” program authorized under the American Recovery and Reinvestment Act of 2009; because of the similarity in program structure, DOT will continue to refer to the program as ‘‘TIGER Discretionary Grants.’’ As with previous rounds of TIGER, funds for the FY 2014 TIGER program were awarded on a competitive basis for projects that will have a significant impact on the nation, a metropolitan area, or a region. For this latest funding round (applications were due in April 2014), $9.5 billion was requested and there were 797 eligible applications.	State, local, and tribal governments, including U.S. territories, transit agencies, port authorities, MPOs, other political subdivisions of State or local governments, and multi-State or multi-jurisdictional groups applying through a single lead applicant (for multi-jurisdictional groups, each member of the group, including the lead applicant, must be an otherwise eligible applicant).	Grant (for planning grants, no minimum, but a maximum of $ 3million; for capital grants for an urbanized area, a $10 million minimum and for a rural area $ 1million; maximum for any grant is $200 million)	Planning, Capital	80% for urban areas, 100% for rural areas

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
Transit-Oriented Development Planning Pilot	MAP-21 allocates new discretionary grant funding for this pilot. Eligible activities include comprehensive planning in corridors with new rail, BRT, or core capacity projects. The comprehensive plans should seek to enhance economic development, ridership and other goals; facilitate multimodal connectivity and accessibility; increase access to transit hubs for pedestrian and bicycle traffic; enable mixed-use development (residential, commercial, institutional, or industrial); identify infrastructure needs associated with the project; and include private-sector participation. MAP-21 authorizes $10 million for FY 2013 and $10 million for FY 2014.	State and local government agencies	Grant	Capital	80%
Transportation Alternatives Program (TAP)	MAP-21 establishes a new program, the Transportation Alternatives Program (TAP) which replaces the funding from pre-MAP-21 programs, including Transportation Enhancements and others and several other discretionary programs, wrapping them into a single funding source. TAP provides funding assistance for projects/activities related to surface transportation and falling under the definition of "Transportation Alternatives." The fund can be used for the historic preservation and rehabilitation of historic transportation facilities as well as for preservation of railway corridors no longer in use. The funding authorization is $809 million for FY 21013 and $820 million for FY 2014. Each State's TAP funding is determined by dividing the national total among the States based on each State's proportionate share of FY 2009 Transportation Enhancements funding.	In general, State DOTs administer TAP funds. Entities eligible to receive TAP funds include local governments; regional transportation authorities; transit agencies; natural resource or public land agencies; tribal governments; and any other local or regional governmental entity with responsibility for oversight of transportation or recreational trails (other than a metropolitan planning organization or a State agency) that the State determines to be eligible, consistent with specified statutory goals.	Grant	Rehabilitation, Preservation, Operation	Up to 80%

Funding Program Name	Description	Eligible Recipients	Type of support	Eligible Costs Covered	Federal Share
Transportation Infrastructure Finance and Innovation Act (TIFIA)	TIFIA is a federal credit assistance program that (1) aids surface transportation projects of national or regional significance to access direct loans, loan guarantees, and standby lines of credit through improved access to capital markets and (2) offers better interest rates than are available in the private capital market. TIFIA was created to reduce state and local government's dependence on user-backed revenue streams to finance large-scale transportation projects due to the uncertainties involved. The amount of federal credit assistance may not exceed 49% of total reasonably anticipated eligible project costs. The exact terms for each loan are negotiated between the US DOT and the borrower, based on the project-specific cost and revenue profile of the project and any other relevant factors. Eligible surface transportation projects may include highways, transit, railroads, intermodal freight, and port access projects. While MAP-21 authorizes $750 million in FY 2013 and $1 billion in FY 2014 in TIFIA budget authority from the Highway Trust Fund to pay the subsidy cost of TIFIA credit assistance, after reductions for administrative expenses and application of the annual obligation limitation, the program will have approximately $690 million available in FY 2013 and $920 million in FY 2014 to provide credit subsidy support to projects. As of June 2014, the total amount approved for the program, including active and retired credit agreements, was $63,742 million for project costs and $17,081.287 million for the credit amount. The TIFIA Interest Rate was 3.24% for a 35-year loan as of August 12, 2014.	Public or private entities such as state DOTs, local governments, transit agencies, special authorities, special districts, railroad companies, and private firms or consortia that may include companies specializing in engineering, construction, materials, and/or the operation of transportation facilities.	Secured loans, loan guarantees and standby lines of credit (3.55% interest rate for 35 years)	Capital, Design, Operating	33-49%

Sources:

FHWA	https://www.fhwa.dot.gov/ipd/finance/tools_programs/federal_credit_assistance/index.htm
FRA	http://www.fra.dot.gov/Page/P0021
FTA	http://www.fta.dot.gov/grants.html
Grants.gov	http://www.grants.gov
Economic Development Administration	http://www.eda.gov/funding-opportunities/

APPENDIX B

State Rail Funding Programs

The following state-specific funding programs were listed in a selection of state rail plans reviewed as part of the research.

State	Rail Funding Program	Description
Arizona	Sales tax for transportation projects	In Arizona, Maricopa County authorized a 20-year continuation of the half-cent sales tax for transportation projects in the county initially approved in 1985. The estimated revenues from the tax will total approximately $14.3 billion (year of expenditure dollars) for the 20-year period covering calendar years 2006 through 2025 and represent the major funding source for implementation of the Maricopa Association of Governments Regional Transportation Plan. Out of the $14.3 billion, 33.3% will be allocated to the public transportation fund, for capital construction, maintenance, and operation of public transportation classifications, and capital costs and utility relocation costs associated with a light rail public transit system. The other 66.6% is allocated to the regional road fund.
Connecticut	Gross Earnings Tax Exemption Program	Given that most of the tracks operated by freight railroads in Connecticut are owned by the state, Connecticut exempts railroads from the state's Gross Earnings Tax if they are to use the money they save in capital improvements, citing them as a "public purpose." Exemptions amount to several thousand dollars annually
	Fixing Freight First Program—Rail Preservation and Improvement Program	This program provides capital grants to freight rail companies. The Connecticut General Assembly has authorized $10 million in bonds to fund the program, with an emphasis on projects that improve, modernize, or repair privately owned lines, increase freight rail traffic, improve safety at grade crossings, or connect to major freight generators. In January 2013, 9 million dollars were added by the Bond Commission to $1 million already in place for an economic development program designed to rebuild Connecticut's freight rail system, called "Fixing Freight First." Under this program, rail companies can apply for the $10 million to repair and modernize rail, rail beds, crossings, culverts, and related facilities.
Delaware	Shellpot Bridge Rehabilitation Project	As part of the Shellpot agreement, the Delaware DOT collects tolls from the Norfolk Southern Corporation (NS) railroad company, calculated by scanning the electronic tags on rail cars. Automatic Equipment Identification scanners are used to count the number of cars and locomotives passing over the Shellpot Bridge. Payments to the DOT by NS are made annually for a 20-year period based on the number of freight cars that use the bridge in a specific year.
Georgia	Goods Movement Investment Fund	This is a proposed fund that could be created in the state treasury and be capitalized by the following revenue sources to finance freight rail projects: (1) a diesel fuel tax paid by the railroads, (2) railroad property lease income, and (3) a penny gas tax.

State	Rail Funding Program	Description
Illinois	Rail Freight Program (RFP)	The RFP's primary goal is to provide capital assistance to communities, railroads, and shippers to preserve and improve rail freight service in Illinois and to facilitate investments in rail service and infrastructure by serving as a broker between interested parties and channeling government funds to projects that achieve statewide economic development. Capital funding is provided in the form of low-interest loans and/or grants. For fiscal years 2011–2015, the program has allocated $18.5 million from federal budget and state revenues for rail improvement projects.
	CREATE	The Chicago Region Environmental and Transportation Efficiency Program (CREATE) is a $3.2 billion program brought about to facilitate critically needed capital investment for rail infrastructural improvements, focused on increasing the efficiency of the region's rail network, and subsequently enhancing the quality of life of Chicago-area residents. This PPP will be jointly funded by federal and state funds, as well as by participating railroad companies.
Indiana	Industrial Rail Service Fund (IRSF)	Funded through 0.029% of the state sales tax and the repayment of past loans, the IRSF provides grants and low-interest loans to Class II and III railroads, as well as short lines operated by local port authorities to help upgrade freight railroad infrastructure and accommodate new business development. Funding cannot exceed 75% of the total cost of the project, but the railroad's contribution may include funds from other state or federal entities. In FY 2011, IRSF grants totaling $1,498,407 were awarded to eight railroads in the state. IRSF 2014 Guidelines were issued in October 2013.
	Railroad Grade Crossing Fund (RRGCF)	RRGCF, administered by the state DOT, provides resources for railroad crossing safety improvements to local jurisdictions, counties, and Class II and III railroads. The RRGCF is divided into two programs: the Crossing Closure Program and the Other Safety Improvements Program. The Crossing Closure Program is designed to compensate communities that close a crossing, if deemed the most effective safety measure by the FRA.
Iowa	Railroad Revolving Loan and Grant Program	The program offers loans, grants, or combinations thereof, to spur economic development and job growth and aid railroads in preserving and improving the rail transportation system. The program is funded through appropriations from the state legislature and repayments from loans for rail development projects funded in the past. The grant funding is limited to 50% of the total funds available. In September 2012, the Iowa Transportation Commission approved $2.8 million for loans and $ 1.2 million in grants. For state FY 2015, the program has an expected minimum of $4,000,000 available for eligible projects.
	Grade Crossing Surface Repair Fund	The grade crossing surface repair programs participate in the cost to rebuild highway-railroad grade crossings. The fund covers 60% of project costs, with the remainder coming from the railroad (20% match) and public road jurisdiction (20% match). Funding stands at approximately $900,000 per year.
	Highway Grade Crossing Safety Program	Intended to improve the safety of public railway-highway grade crossings, the program has an annual funding of $4 million to $5 million and pays for up to 75% of the maintenance costs of active warning systems installed. The program requires a 10% non-federal match by the railroad/public road jurisdiction.
Kansas	State Rail Service Improvement Fund (SRSIF)	Initiated in 1999, the SRSIF provided $3 million annually for 10 years in low-interest loans and grants to railroads and port authorities operating in the state of Kansas for the purpose of preserving rail service and improving level of service. The loan program is structured as a 70% state loan and a 30% railroad/port authority match funding arrangement. The Kansas legislature approved an increase in SRSIF funding to $5 million annually beginning July 1, 2013.

State	Rail Funding Program	Description
	Highway/Railroad Crossing Program	The state-funded Highway/Railroad Crossing Program is a $300,000 per year program that addresses highway/railroad safety improvements that do not meet federal aid program eligibility requirements. Local jurisdictions must submit potential projects for funding through this program. Projects selected for funding are eligible for 80% state funding with a required 20% rail company funding match.
	Community Development Block Grant Program	The Community Development Block Grant Program, run through the Department of Commerce, provides economic development funds to eligible small city and county governments. This program provides 50% grant/50% loan funding for infrastructure improvements, including rail spurs, designed to assist companies in creating jobs through the construction or renovation of facilities. Companies may apply for up to $35,000 per job created with a maximum limit of $750,000. The loan portion of funding is required to be paid back over a 10-year period with 2% interest.
Maine	Industrial Rail Access Program (IRAP)	The program offers 50/50 matching funds to private businesses looking to upgrade sidings, switches, and other rail infrastructure. More than $6.2 million has been invested in IRAP since 1997 (approximately $500,000 annually). The 2014 program is funded with $2 million in state funds.
	Critical Rail Corridors Program	The program provides 50% matching funds for priority investments on critical rail corridors. Projects that score the strongest in terms of providing public benefit will be undertaken during this program. Funding allocated for this program in the state work plan for 2010–2011 stood at $16 million.
	Freight Rail Interchange Program (FRIP)	FRIP provides 50% matching funds on capital investment projects for improvements to railroad interchanges/junctions. The result of such projects can improve the flow of goods in and out of the state as well as between the rail providers.
	Rail Access Initiative Links Program (RAIL)	RAIL provides 100 lb. stick rail to businesses adjacent to rail lines on a 50% matching funds basis. This program can also be used to induce new rail service for groups of rail-dependent industries.
	Local Rail Freight Assistance Program (LRFA)	LRFA is a revolving, interest-free loan program for those property owners adjacent to railroads and wishing to improve access to rail facilities.
	Rail Corridor Protection Program (RCPP)	RCPP allows the State of Maine to partner with railroads to lease or buy rail corridors in order to improve threatened rail corridors. Preserving the rail corridors that serve as a vital link to Maine businesses is critical to the state‘s economy. This program will protect against deferred maintenance or abandonment by the rail owner on rail corridors critical to the state‘s economy.
	Capital Rail Maintenance of State-Owned Track	Rail maintenance funding amounts to $150,000 annually for Maine’s 320 miles of state-owned track, which is highly insufficient considering future needs given the substantial backlog of work needed on state-owned track. The state‘s Two-Year Capital Work Plan proposed a $2-million funding level for this program. In the summer of 2009, the Maine State legislature reduced the funding level on the November FY 2010–2011 bond proposal to $1 million. The bond issue was approved in November 2009.

State	Rail Funding Program	Description
Massachusetts	Industrial Rail Access Program (IRAP)	IRAP was proposed in the 2010 state rail plan to allow financial assistance to localities, businesses, and/or industries seeking to provide freight rail service between the site of an existing or proposed commercial facility and common carrier railroad tracks. IRAP would give private rail companies access to public funds, thus boosting economic development. The proposed IRAP requirements include a competitive grant process with at least 50% matching funds and projects should demonstrate quantitative and qualitative economic benefits (e.g., job creation and retention) and increased state/local tax revenue from the benefiting businesses with mitigation for any impacts on passenger rail services. In April 2013, the state announced that nine IRAP recipients would receive a total of $2.85 million.
Michigan	Michigan Rail Loan Assistance Program (MiRLAP)	MiRLAP is a revolving loan program designed to contribute to the stability and growth of the state's business and industry by helping to preserve and improve Michigan's rail freight infrastructure. The program awards interest-free loans on a competitive basis to fund rail infrastructure preservation projects (e.g., track rehabilitation and bridge/culvert repair projects). Up to 90% of a project's eligible costs can be covered, with a repayment period of up to 10 years. Since 1997, $7.2million have been appropriated to the program. Due to state budgetary constraints, the MiRLAP fund balance was diverted to the state's General Fund in 2010. The program began accepting applications again in June 2012.
	Freight Economic Development Program (FEDP)	FEDP provides low-interest loans to provide new or expanding businesses access to the rail system. Up to 50% of rail infrastructure costs can be loaned at a minimum interest rate of 2% below the prime rate, with a 5-year repayment period. If shipping commitments are met for each of the 5 years, the loan payments are forgiven and funding converts to a grant.
	State-Owned Rail Property Capital Development	The Capital Development Program provides ongoing property management and infrastructure rehabilitation so as to maintain the safety and functionality of the 530 miles of active state-owned lines and to ensure service provision to the shippers.
	Local Grade Crossing Program (LGCP)	LGCP helps local governments and railroad companies develop and implement projects that enhance safety at public highway-railroad crossings. LGCP provides cash incentives to road authorities for road closures and covers up to 100% of the project costs associated with relocating/realigning active track to eliminate public grade crossings. Since 2000, $8.5 million have been spent on safety measures as part of this program.
Minnesota	Tax Credit Programs	Two programs offer tax credits: - A state income tax credit for 25% of the annual amount spent on capacity expansion—track, structures, yards, signal and communication systems, terminals, and intermodal facilities. - A state Maintenance Tax Credit for short-line rail improvements to track and structures to accommodate standard 286,000 lb. train cars could be calibrated to offset 10% of the total costs of the upgrades.
	Grade crossing improvements	Minnesota DOT receives roughly $5 million annually in federal grade crossing protection funds, matched by $600,000 in state funding.

State	Rail Funding Program	Description
Missouri	State Transportation Assistance Revolving Fund (STAR)	STAR, administered by the Missouri Highways and Transportation Commission, provides loans on favorable terms for the planning, acquisition, development, and construction of passenger and freight rail facilities and the purchase of rolling stock for transit purposes, although it is not limited to rail transit and includes aviation, water, and mass transit. Loans have ranged from $84,000 to $1 million with interest rates ranging from 2.57% to 3.61%. The loan term is typically no more than 10 years. STAR has disbursed approximately $3 million in loans over the past 5 years.
	The Missouri Transportation Finance Corporation (MTFC)	MTFC provides loans to all transportation modes (including highway projects) with the same terms as STAR. However the MTFC is a larger program and can fund larger projects than STAR. Rail projects are eligible under the MTFC Loan Program.
Montana	Montana Rail Freight Loan Program (MRFL)	MRFL is a revolving loan fund administered by the Montana DOT to facilitate construction/reconstruction and rehabilitation of railroads and related facilities in the state. The fund issues grants, interest, and no-interest loans. Projects have to demonstrate cost-effective service to community and businesses. Rehabilitation and improvement projects require a 30% match, while construction projects require a 50% match.
New Hampshire	Special Railroad Fund	The fund constitutes income from state-owned rail lines, as well as 25% of the revenue received from the state railroad tax, deposited in a dedicated fund and used for maintenance and repair of state-owned rail lines.
	Rail Line Revolving Loan Fund	Established in 1993, the Rail Line Loan Fund was funded by state bonds and additional money, to a total amount of $4 million. Loans were issued for up to 20 years. Eligible projects included short-line railroad capital improvement projects.
	State Capital Budget	The New Hampshire's bi-annual capital budget provides funding for major long-term capital investments. As owner of railroad property, the state includes repairs to the state-owned lines in the capital budget. Rail projects funded include bridge repairs, rail replacement, and other improvements on various rail lines.
New York	Rail Service Preservation Program	The program appropriates $100 million over 5 years to passenger and freight rail capital projects, beginning in 2005-6. Funding includes a state subsidy paid to Amtrak by the NYS DOT. No local match is required.
	Rebuild and Renew New York Transportation Bond Act 2005	The Act allocates $27 million annually for rail and port projects. A 10% local match is required.
	Industrial Access Program	The program provides state funding for necessary road and bridge improvements that enhance traffic flow and boost economic development, resulting in creation/retention of jobs. The program has a 60% grant, 40% loan configuration, with repayment periods based on project cost. No new funding has been appropriated since SFY 06-07.
	Multimodal Program	The program provides state funding for capital improvements, not limited to railroads. Projects are nominated by the governor or the legislature. The DOT has no role in project selection. No local matching is required.

State	Rail Funding Program	Description
	Passenger & Freight Rail Assistance Program	The NY SFY 2014–15 budget provides an additional $16 million in new accelerated capital funding to maintain and modernize freight rail infrastructure across the State. Although there is no minimum or maximum amount of individual project award, the individual award cannot exceed the funds available. Eligible project types include any rail capital improvement with a service life of 10 years or greater. NYSDOT cannot approve, undertake, support or finance a public infrastructure project, including grants, awards, loans, or other assistance programs, unless, to the extent practicable, it is consistent with the relevant Smart Growth Public Infrastructure Criteria. The Program is a reimbursement grant program; project grantees are required to pay all bills before requesting reimbursement. There is no minimum match requirement; the Program may fund up to 100% of project costs. Preference will be given to those applications able to provide a greater local share of total project costs.
North Carolina	Rail Industrial Access Program	The DOT for North Carolina created the Rail Industrial Access Program to encourage railroads to locate or expand their facilities in North Carolina and improve rail access. The funding helps ensure that companies have access to well-maintained and functional tracks needed to transport freight and materials. The fund supports construction and refurbishing of tracks as required by the local economy. Eligible applicants may include local governments, community development agencies, railroad companies, and industries. The program uses state funding with a commitment of matching funds by the applicant; recipients may receive a maximum 50% of total project costs.
North Dakota	Local Rail Service Assistance (LRSA)	Both LRSA and FRIP rail loan funds make available reduced-interest loans, mostly for infrastructure projects on short-line railroads, and provides them with an alternative to commercial lending sources, which are considerably more costly. The funds offer low interest rates and a 10-year repayment period. The LRSA account is funded with the principal from repaid loans, plus the interest the LRSA account itself bears. The FRIP account is funded with the principal and interest from repaid FRIP loans, interest from repaid LRSA loans, and the interest the account itself bears.
	Freight Rail Improvement Program (FRIP)	
Ohio	Freight Development/Rail Spur Program	This program helps companies for new rail and rail-related infrastructure. The goal of the program is to promote the retention and development of Ohio companies through the use of rail transportation, including rail access and carload generation to existing operations. Grant funding is generally limited to projects where job creation is involved. Loan financing is available, even when jobs are not created or retained. The standard loan package is a 5-year loan term and an interest rate, which equals 2/3 of prime at the time of the loan closing. Collateral or a letter of credit is required.
	Rail Improvement Program	The Rail Improvement Program is intended to preserve and enhance existing rail lines and corridors; provide rail access to retain existing and attract new businesses; provide Ohio's communities and industries with transportation options, connectivity, and opportunities; improve safety at grade crossings; reduce derailments; improve environmental quality, especially in terms of air quality; improve on-time performance; preserve, maintain, expand, and modernize Ohio's rail system; preserve existing tracks and rights of way for future use; and improve access to global and domestic markets.

State	Rail Funding Program	Description
	Rail Line Acquisition Program	This program provides assistance for the acquisition of rail lines to prevent the cessation of service, preserve the line or right of way for future rail development, or enhance the line's viability. Funding requests are evaluated on the basis of the importance of the rail line for rail users and overhead traffic, the number of people employed by rail-dependent rail users, and the importance of the line with respect to affected shipper transportation costs.
	Railroad Grade Crossing Safety Program	This program provides funding for highway-railroad grade crossing safety improvements or corrective activities designed to alleviate highway-railroad hazards. The Program is divided into four programs based on the type of project and method of project identification: • Formula-based upgrade program (warning device) • Corridor-based upgrade program (warning device) • Constituent-identified program (warning device) • Preemption program (warning device with traffic signal interconnection) FY 2011-2012 Program results include investments of approximately $47.7 million in safety improvements around the state.
Oklahoma	Railroad Maintenance Revolving Fund	The fund is mostly capitalized using revenue from the Oklahoma Freight Car Tax, an annual 4% tax on freight rail car revenues. Other sources of revenue for the fund include annual lease and operations payments from seven separate short-line rail operators and right-of-way sales by the Oklahoma DOT, although the sales are not a very significant contributor to annual funding. If the ConnectOklahoma Multimodal Transportation Act passed in 2014, this program is now the ConnectOklahoma Mass Transit and Infrastructure Revolving Fund.
Oregon	Short-line infrastructure program	Oregon State designated $2 million to create a short-line infrastructure program in 2001, offering loans and grants. In 2003, the legislature approved an additional $2 million for the original program and began an $8 million rail spur program for all types of railroads.
	Connect Oregon	The Oregon legislature authorized $100 million to fund the program in each of the 2005-07, 2007-09, and 2009-11 biennia and an additional $40 million was authorized in 2011 for the 2011-13 biennium for a Multimodal Transportation program known as Connect Oregon, a lottery-backed program.
Pennsylvania	Rail Freight Assistance Program (RFAP)	RFAP preserves essential rail freight service where economically feasible and preserves or stimulates economic development by generating new or expanded rail freight service. Grants are awarded on a competitive basis. The maximum state funding for a RFAP project is 70% of the total project costs. RFAP project funding is not to exceed $700,000, with the construction component limited to $250,000 for new constructions. The current RFAP allocation is $10.5 million.
	Rail Transportation Assistance Program (Rail TAP)	Rail TAP preserves essential rail freight service where economically feasible and preserves or stimulates economic development by generating new or expanded rail freight service. Grants are awarded on a competitive basis. The maximum state funding for a Rail TAP project is 70% of the total project costs. Rail TAP funds can be used for various construction and rehabilitation projects, including land acquisition for rail projects. The typical annual Rail TAP appropriation has been approximately $30 million; the current allocation is $20 million.

State	Rail Funding Program	Description
Tennessee	Short-Line Railroad Rehabilitation Program	The State of Tennessee levies a tax on diesel fuel used by aeronautics, railroads, and towboats. From this tax, a portion is used to fund its Short-Line Railroad Rehabilitation Program. The program is split into two parts: track rehabilitation and bridge rehabilitation, with both requiring a 10% match. Over the past 10 years, the program has awarded $66.87 million to short lines in Tennessee, typically $7 million to $8 million annually.
Texas	Rail Relocation and Improvement Fund	In 2005, Texas created the Rail Relocation and Improvement Fund to help share the cost of relocating and improving rail facilities, both public and private, to improve freight mobility and relieve traffic congestion. The cost of relocation is shared by the state and the railroads in proportion to the benefit each entity receives for improvements. In 2009, the Texas legislature appropriated $182 million for the Rail Relocation Fund for the 2-year budget period; FY 2011 funding was uncertain.
Virginia	Rail Industrial Access program (RIA)	RIA provides up to $450,000 in grant funds for construction of rails to serve industry per jurisdiction per year with the first $300K unmatched and additional $150K matched 50/50; all $450K can be applied to one project. The funding for this program is to be set forth in the Appropriations Act. In recent years, RIA has been budgeted an average of approximately $2.4 million per year.
	Rail Enhancement Fund	Created in 2005, the fund supports improvements for passenger and freight rail transportation throughout Virginia. Projects must exceed 1.0 on a Benefit-Cost Analysis. The fund has a dedicated revenue stream from the Rental Car Tax.
	Rail Preservation and Development Program	The Rail Preservation and Development Program was initiated in 1991. Since then it has grown to nearly $3 million per year. This fund administers grants to the railroads for qualifying projects, with recipients providing a 30% match. The Program is funded annually through the Appropriations Act.
Washington	The Essential Rail Assistance Account	This dedicated rail account in the state treasury is to be used for acquisition or rehabilitation of rail lines, equipment, mitigation of port or mainline congestion, and corridor preservation.
	Grain Train Revolving Fund	This revolving fund is a financially self-sustaining transportation program that supports Washington's farmers, short-line railroads, and rural economic development. The program operates without taxpayer subsidy.
	Freight Rail Assistance Program	This is a grant program where WSDOT provides grants to support branch lines and light-density rail lines, provide or improve access to ports, maintain mainline capacity, and preserve and restore rail corridors and infrastructure. The program was allocated $2.75 million in 2009-2011, $4 million during the 2013–2015 biennium and there has been a call for projects for the 2015–2017 biennium.
	Freight Rail Investment Bank Program	This grant program is managed by the State Rail and Marine Office. The governor and state legislature allocated $7.33 million for the Freight Rail Investment Bank Program (Rail Bank) during the 2013–2015 biennium. The Rail Bank provides funding assistance to smaller capital rail projects. Funds will be available for up to $250,000 with at least 20% matching from other sources.

State	Rail Funding Program	Description
Active SIBs: Alaska, Colorado, Florida, Maine, Michigan, Minnesota, Missouri, Nebraska, New Mexico, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, Wyoming Inactive SIBs: Arizona, Arkansas, California, Delaware, Indiana, Iowa, New York, Oklahoma, Rhode Island, Tennessee	State Infrastructure Banks (SIBs)	A State Infrastructure Bank (SIB) is a revolving fund established and operated by the state. A SIB can offer direct loans with low interest rates and various types of credit enhancement products to surface transportation infrastructure projects, including loan guarantees and lines of credit. It may provide financial support to both public and private sponsors of eligible transportation projects. Federal and state funds are used to capitalize the SIB, although several states have established SIBs or separate SIB accounts capitalized solely with state funds. A percentage of federal funds is transferred from specific modal accounts, and these funds are matched with state money. A state must provide 20% matching to the federal funds used to capitalize the SIB. The interest rate is set by the state and is typically below market rate, even 0% in some cases, thus it can make large projects affordable. Maximum loan term is 35 years, although negotiable. Technically speaking, 33 states to date have established SIBs since the program inception in 1995, however 10 are inactive (not capitalized). Their size varies from under $1 million to more than $100 million.

Source: State Rail Plans

APPENDIX C

U.S. Commuter Rail and Track Ownership

Commuter Rail Name	Interactions with Freight Rail and Amtrak
Altamont Commuter Express	Operates over UP tracks in CA from Stockton to San Jose
Central Puget Sound Regional Transit Authority	Partly BNSF and partly UP trackage rights
Connecticut Department of Transportation	Operates on agency-owned tracks over which Amtrak has trackage rights, but also on Amtrak NEC tracks
Dallas Area Rapid Transit (DART)	Mostly trackage rights on UP, but some agency trackage
Denton County Transportation Authority	Agency trackage
Maryland Transit Administration	Operates on CSX and Amtrak tracks
Massachusetts Bay Transportation Authority	Operates on agency-owned tracks with some CSX trackage rights
Metro Transit (Minneapolis)	Agency-owned tracks
Metro-North Commuter Railroad Company, Doing Business As (dba): MTA Metro-North Railroad	Agency-owned tracks and Amtrak-owned tracks (minor)
MTA Long Island Rail Road	Agency-owned tracks and Amtrak-owned tracks (NY Penn Station and NYC area)
New Jersey Transit Corporation	Agency-owned and Amtrak-owned tracks (NEC)
North County Transit District	Operates in San Diego area to Oceanside on agency-owned tracks over which BNSF has trackage rights
Northeast Illinois Regional Commuter Railroad Corporation dba: METRA Rail	Operates mostly on agency track, but also on UP and BNSF tracks, among other railroads
Northern Indiana Commuter Transportation District	Operates on agency tracks
Northern New England Passenger Rail Authority	Operates on Central Puget Sound Regional Transit Authority system and on Massachusetts Bay Transportation Authority tracks
Peninsula Corridor Joint Powers Board dba: Caltrain	Operates on agency-owned tracks over which UP has trackage rights
Pennsylvania Department of Transportation	Amtrak-owned tracks (Harrisburg to Philadelphia)
Regional Transportation Authority	Trackage rights on Nashville and Eastern Railroad
Rio Metro Regional Transit District	Trackage rights on BNSF
South Florida Regional Transportation Authority	Operates on agency track with CSX trackage rights
Southeastern Pennsylvania Transportation Authority	Mostly Amtrak-owned tracks, but also some agency owned
Southern California Regional Rail Authority dba: Metrolink (Metrolink)	Operates partly on agency-owned tracks (with BNSF or UP trackage rights), but also on tracks owned by UP and BNSF
Utah Transit Authority	Partly agency owned, partly UP trackage rights
Virginia Railway Express	CSX and Amtrak trackage rights

Source: CPCS team analysis of individual commuter rail companies listed in National Transit Database 2011.

APPENDIX D

Global Scan of Rail Industry Structures, Funding and Financing Approaches

United Kingdom Rail Sector Context

Until the mid-1990s, passenger and freight rail services in the UK were largely provided by British Railways (BR), a government-owned company that owned the rail infrastructure and operated passenger and freight services across Britain. Since then, BR has been dismantled and the industry restructured through the separation of infrastructure from operations (also known as "vertical separation"), as follows:

- Railtrack—a newly created infrastructure company—was given ownership of track and station infrastructure and most train depots, becoming the regulated monopoly supplier of infrastructure services. Railtrack was privatized through an initial public offering (flotation) of shares, but went bankrupt and in 2002 and was replaced by Network Rail, a not-for-dividend private company that has no shareholders. Most of its borrowing is backed by a government guarantee.[1] Network Rail recovers its costs mostly from track-access charges paid by passenger and freight rail operating companies, but also receives substantial direct capital grant payments from government.
- Passenger rail services were privatized (1995–1997) and are mostly operated by private "Train Operating Companies" (TOC) under competitively tendered franchises granted by the central or local government. Passenger operators pay track-access charges to Network Rail.
- Freight services were also privatized and are now operated by private "freight-operating companies" (FOC). Unlike passenger services, freight services are not operated under franchise agreements but on a competitive basis with open access to use rail infrastructure owned and managed by Network Rail. Freight operators generally pay only the marginal cost for access to infrastructure.

Rail passenger and freight services share common tracks although there are some branch (short) lines used only for freight and some radial lines into major cities used only for passenger services. Freight services operate throughout the day but have lower priority access to the network than passenger services, which means they rarely gain access to congested commuter routes in peak

Unlike the US where train miles are dominated by freight, passenger traffic in the UK represents over 90% of train miles and total cost. The railroad therefore largely exists for passenger services, in sharp contrast to the US where freight services are far more significant in terms of use of the rail network.

[1] Network Rail is supposed to operate as a commercial business and its managers are incentivised by bonuses rather than through normal commercial pressures.

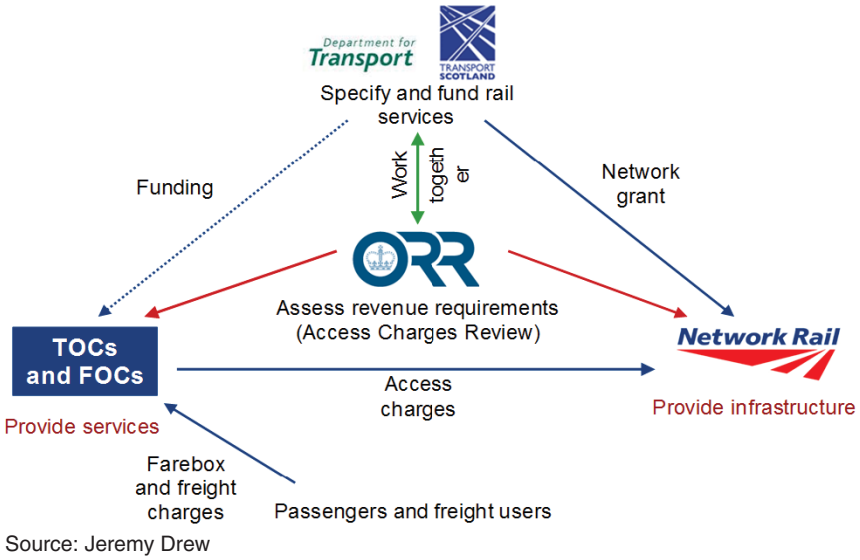


Figure D-1. UK Rail funding structure.

hours. Access charges, rights and priorities are determined by the Office of Rail Regulation (ORR). The funding structure for the UK rail sector is presented in Figure D-1.

Rail Infrastructure Context in the UK

Network Rail bears the financial responsibility for maintaining infrastructure used by both freight and passenger operators. Network Rail receives revenues from track-access charges and also receives direct grants from the central government. Additional financing requirements—particularly for large capital projects—are met by debt raised on capital markets, multi-currency notes[2] and commercial paper.[3] So far, all of Network Rail's debt has been subject to government guarantee, although it is the intention that Network Rail will in due course begin to borrow without guarantee. The government in general would prefer that Network Rail borrow directly (rather than for the government itself to borrow and lend to them), even though it pays around a half a percent more interest that way. This is for fiscal reasons (it avoids appearing to add to the level of official government debt).

The funding structure for Network Rail now seems to work relatively well, even if it was not the original structure desired by the government.

Infrastructure Privatization: UK Experience

At privatization, the UK government had intended that investment in infrastructure would be funded from the (private) infrastructure company Railtrack. Investments would be funded from income from access charges and from debt raised on this reliable source of income.

The intention was that investment in infrastructure would be funded without direct government support through the commercial incentives and regulation

[2] Notes are bonds with maturity of less than 10 years when issued.
[3] Commercial paper consists of unsecured notes issued by the company.

of Railtrack. Nearly all government support for passenger services would be channeled through revenue payments to private franchised passenger operators, with which government would have binding contracts. This was intended to ensure that investment choices would thereby be made mainly on the basis of market needs.

In practice, Railtrack suffered gross mismanagement and it went into administration (the UK equivalent of Chapter 11) after a serious accident and severe cost overruns on the West Coast modernization project. While Railtrack had made significant safety improvements, several catastrophic accidents and the cost overruns required a government bailout (as Railtrack was too big and too important to fail).

Following the replacement of Railtrack by Network Rail in 2002, the government decided that a larger share of infrastructure costs should be financed through direct payments (grants) to Network Rail. These payments supplement financing from revenue (mainly track access charges) and loans, thereby improving Network Rail's ability to finance investment. As part of the regulatory review process to determine track access charges, the government now defines its required outputs from the infrastructure company and the funding it will provide; these are taken into account by the Regulator in determining the level of track access charges.

Freight Context in the UK

Rail freight in Britain is still mainly bulk traffic, especially imported coal from ports to power stations. Container traffic to and from the ports has grown over recent years to become as important as coal. Other traffic includes bulk items like building stone, and hazardous cargos including nuclear fuel.

There are now six main freight-operating companies all providing services across Great Britain. The largest is the German-owned DB Schenker (UK), formerly the English, Welsh and Scottish (EWS) railway. As freight-operating companies compete with each other and with other modes, freight rates are not regulated. The profits of rail freight companies are, in general, modest, although some of the most efficient new entrants have Earnings before Income and Tax (EBIT) margins in excess of 15%, using mostly leased equipment.

Private freight rail operating companies finance investments in much the same way as US freight companies—through equity and commercially available financial products. Rolling stock is typically leased from rolling stock leasing companies. Because freight operations are regarded as commercial, government support for rail freight operations is minimal compared to that for rail passenger services.

The UK government gives three types of explicit financial support to freight rail, to encourage modal shift (road to rail) and reduce road congestion and environmental impacts of traffic. Grants are available for construction of rail freight terminals, and operating support payments are made for carriage of freight that would otherwise be transported by road. Rail operators also pay lower taxes on diesel fuel than trucking firms, recognizing that road taxes are used partly to pay for road construction and maintenance.

Passenger Context in the UK

Intercity and Commuter Rail in the UK

In terms of contractual relationships and funding, there is no firm divide between regular intercity, high-speed or commuter services, which are sometimes combined in one route concession (with the same concession offering some slower services, with stops at multiple commuter stations, and faster services stopping only at larger towns and cities). For this reason, intercity, high-speed and commuter rail are addressed jointly here.

Most passenger traffic in Britain is carried on intercity routes and on shorter distance commuter services into London; there are also commuter routes into other main cities and other inter-urban and rural services. All track used by passenger services is owned by Network Rail apart from short sections in London owned by Transport for London (which manages all City of London transport services on behalf of the Mayor), the new high-speed line from London to Kent, the Heathrow branch line and some short "museum" lines.

There are 19 passenger franchises (concessions) of which 16 are administered by the central government.[4] The remaining three are administered and funded by devolved bodies because these bodies are considered to be better at managing the specific services in their areas.[5] Most of these franchises operate services used for commuting and other trips into and around major cities.

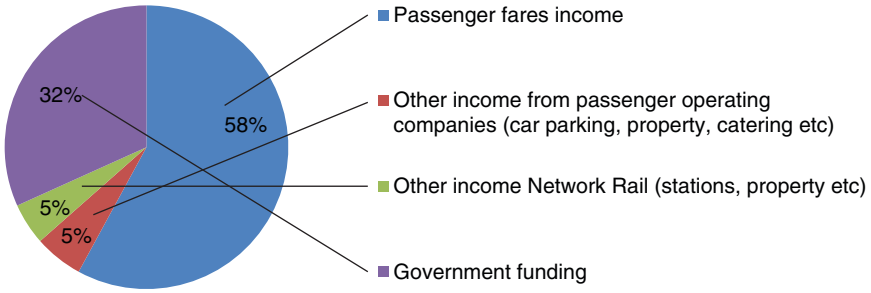
Passenger franchises are typically 5–15 years in length with varying degrees of revenue and cost risk taken by the private sector, as well as varying degrees of commercial freedom. Typically called Train Operating Companies or TOCs, they are chosen through a competitive process with the choice made mainly on the basis of minimum subsidy cost (or maximum payment) to provide defined services. When franchises are let, bidders say how much subsidy they need to receive, or what premium they will pay, in each year of the franchise. They work this out by forecasting fares and other revenues, operating costs, Network Rail access charges, rolling stock leasing costs and profit. Network Rail access charges are set every five years by the regulator (the Office of Rail Regulation). TOCs are fully protected from these changes, so the level of subsidy or premium is reset after each access charge regulatory review.

There are various requirements about the services that must be operated, the rolling stock that must be used, and maximum fares that can be charged (though not all fares are regulated). Most TOCs operate more than the required services and attempt to provide premium services at fares that are not regulated, sometimes using additional rolling stock. TOCs are mainly operated by private entities that borrow commercially, issue bonds, etc., on the open market but some are owned by other European state-owned railroad companies (e.g., SNCF).

Rolling stock is typically leased from rolling stock leasing companies (ROSCOs). Three private ROSCOs were established as part of the UK rail privatization process of the late 1990s. The ROSCOs buy and maintain rolling stock, financing their acquisitions on the private markets.

[4] Concessions let by the UK government are called franchises.

[5] The three concessions administered and funded by devolved bodies are: Transport for Scotland, Transport for London and Merseytravel (Liverpool conurbation). All three operate mostly commuter services although Transport Scotland also operates regional services, and overnight sleepers to London.



Source: Analysis of Great Britain industry financial information 2011-12, Office of Rail Regulation. Of the £4 billion in "Government Funding," nearly all (£3.9 billion) consisted of funding of infrastructure.

Figure D-2. Income for the passenger railroad (2011/12 £bn)—including infrastructure.

They typically work with TOCs to provide the equipment needed to the level of specification and service standard the TOC requires (this includes premium equipment—not required by the franchise agreement but desired by the TOC as a means to increase its market share and profitability).

A few new private passenger train operators operate entirely without subsidy and outside of franchise agreements. These include Hull Trains, Grand Central, and Heathrow Express, and the high-speed international operator Eurostar that runs between London and Europe. Hull Trains and Grand Central operate services over the East Coast Main line, using 125 mph diesel trains, competing with the franchised operator East Coast. Hull Trains has been operating since 2000 and has progressively improved and expanded its rolling stock. These are privately funded and, in the case of Hull Trains and Grand Central, pay only for the variable cost of infrastructure as the policy is to encourage these open-access operators and they would not otherwise be profitable.

Figure D-2 shows the sources of income for the "conventional" domestic passenger railroads (e.g., excluding the London-Paris/Brussels Eurostar service). The figure is an aggregate of all services, and there is wide variation across the network.

While it is difficult to definitively subdivide the network, because virtually all services overlap, about 40% of the operating franchises are profitable after infrastructure grants and actually pay premiums to government, while the others rely mainly on government subsidy.[6] There is a wide variation across the different routes.

High-Speed Rail in the UK

The first (and only) dedicated high-speed rail link in the UK is High Speed One,[7] the 109-km railway link between London and the Channel Tunnel (serving Eurostar). It serves international and domestic passenger services from London. It has been used for some international freight, although only on an experimental basis. High Speed One was developed as a PPP.

[6] UK Office of Rail Regulation, National Rail Trends Data Portal. Data from 2011–12.
[7] Formerly the Channel Tunnel Rail Link.

European Union (excl. UK) Rail Sector Context

Until around 1990, almost all railroads in Europe were operated as government-owned monopolies. Until around 1960 they still expected to operate on a self-supporting basis, with passenger fares and freight tariffs set to offset costs and freight traffic cross-subsidizing at least some passenger services. This was true for each country. However, as competition emerged from road and air transport, railroads had difficulty financing capital investment and most began incurring operating losses.

In 1991, the European Union (EU) introduced Directive 91/440, which began a move towards the separation of infrastructure from train operations activities (called "vertical separation" in the industry). The objective of this, and subsequent EU regulations, has been to increase efficiency, especially for cross-border rail services, by facilitating competition "above the rail" (e.g., for rail operations, not infrastructure) across multiple countries. Competing operators (public or private) are allowed open access to infrastructure in each country and are supposed to be given mandatory trackage rights. Initially this type of access was limited to freight, but it has now been extended to international passenger services and is planned for domestic passenger services. Few state-owned operating companies now have freight monopolies in their country, as they must compete with new entrants.

There are more than 100 smaller railroad companies, some operating several hundred miles of track. These serve local needs and are mostly owned and financed by regional and local governments, which want to keep them open and under their control. Some are owned by private companies or even individuals.

Rail Infrastructure Context in the EU

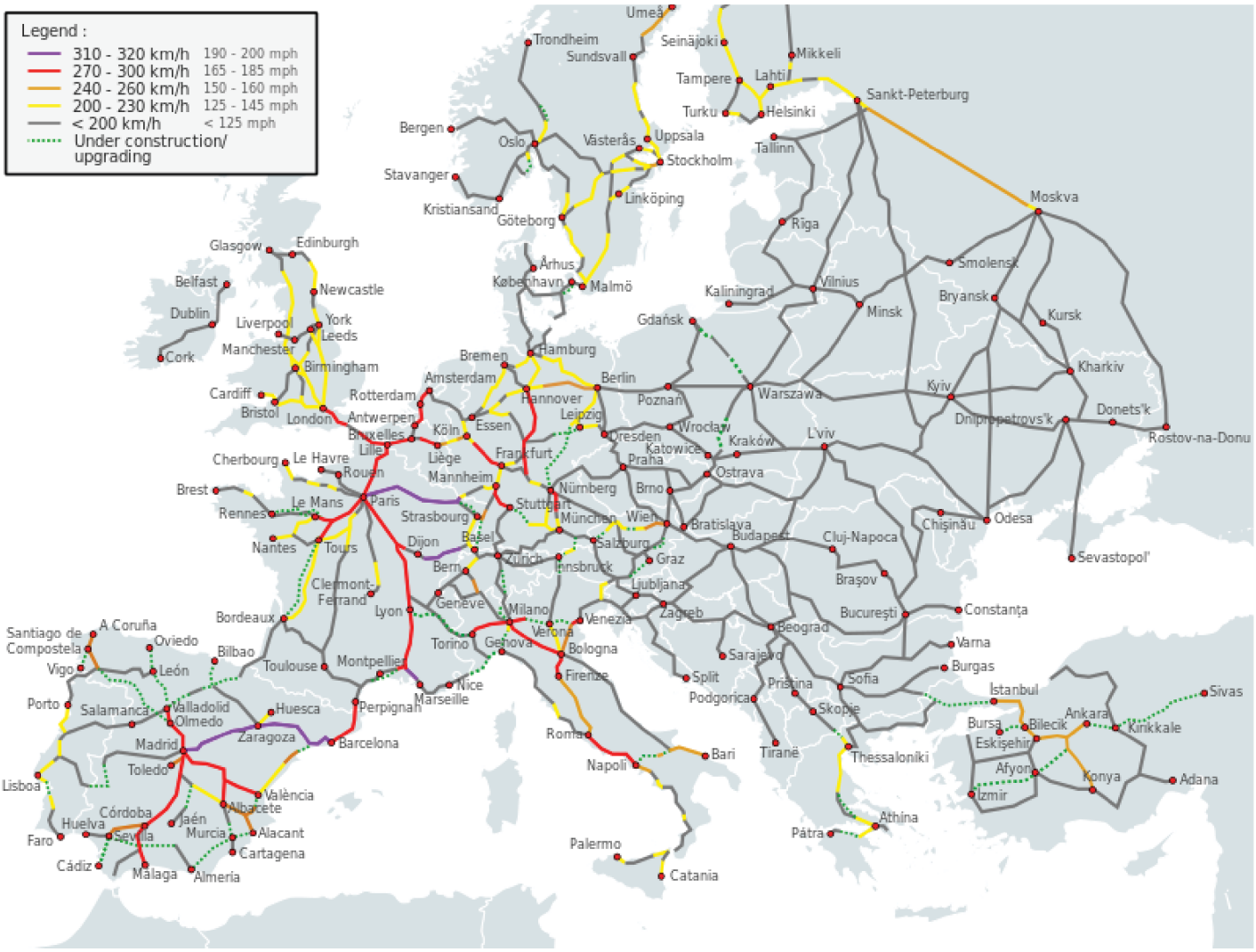
Infrastructure, as a natural monopoly, is managed by a state-owned company in each EU country except the UK.[8] Under EU rules, infrastructure must be managed by a body that is separate in its decision making from any operators. In practice, infrastructure can be managed by a subsidiary of a holding company that also owns operators (as in Germany), provided it has systems in place to ensure fair treatment of competing operators that buy access to the network. Implementation and impact of EU policies varies. Some countries have been slow to implement changes such as open access while some, especially Sweden, Germany and the UK, have made reforms even ahead of EU requirements.

EU requirements have a major impact on the financing of railroads through laws and regulations. These include state aid rules, which prevent aid to potentially commercial operations (with some exceptions) to prevent subsidized, inefficient state operators from under-bidding and thereby undermining the viability of more efficient private enterprises. "Block Grants" are rare and generally contrary to EU law. Grants must be awarded to achieve specific objectives and, where possible, only after competition to ensure good value for money.

While the EU encourages countries to levy charges for infrastructure access that reflect only the direct (variable) costs of infrastructure from operating a train, many countries, particularly in Eastern Europe, set higher charges to recover the fixed cost of operating, maintaining and investing in infrastructure. Notwithstanding the ability to set high access charges, many railroad networks in Eastern Europe continue to have trouble funding track maintenance.

Traditional sources of funding for public investment in infrastructure were historically the central government and revenue from customers of the railroad. With vertical separation,

[8] In some countries it is owned by the state and only managed by the company.



Source: http://en.wikipedia.org/wiki/High-speed_rail_in_Europe#mediaviewer/File:High_Speed_Railroad_Map_of_Europe_2013.svg

Figure D-3. Rail network, Europe.

revenue from customers has been replaced by track-access charges paid by operators for access to the network.

Figure D-3 illustrates the extent of the main rail network in Europe with high-speed (over 200 km/h or 125 mph colored). France, Italy, Germany and Spain have the most developed high-speed rail networks in Europe. A few high-speed lines in Germany are also used by freight traffic.

Freight Context in the EU

As commercial services, the general approach to the financing of freight rail services in Europe is that they must be financed from revenue. However, in some Western European countries, where passenger services are well supported by the government, freight pays lower track-access charges than passenger services and makes little or no contribution to the fixed cost of infrastructure.

Freight rail operations (above the rail), at least in Western Europe, are normally provided on a commercial basis in a competitive and deregulated market. In most countries, competitor freight

rail operators carry up to 55% of total freight rail traffic with the rest carried by the incumbent state-owned operator.[9] The incumbent national operators still dominate carload traffic but competitors have strong positions in unit trains and bulk cargos. Since block trains (unit trains) and bulk cargos are often the most profitable segment, private competition often puts national carriers under increased financial pressure.

Government-owned freight rail companies in many countries, including France, Belgium and Switzerland, have been loss-making and have undergone restructuring. This has been supported by government aid but EU rules require that this be one-off (otherwise it would be anti-competitive as it would disadvantage competitors). However, some government-owned freight rail companies are still in difficulty.

Compared with the US, freight rail in the EU has a much smaller share of total freight traffic. Railroads in Europe have a different role to that in the US. Within the EU, railroads carry 30 times the passenger-miles of the US but only one-seventh the freight ton-miles. There are several reasons. Freight ton-miles are lower in the EU in part because industry is still mostly organized within single countries equivalent in area to US states, with relatively short flows, although this is changing with the creation of the single market. Because it must also serve the passenger role, rail has also been less effective at servicing freight. On the other hand, many lines used by freight would not exist were it not for government funding to provide passenger services.

Passenger Context in the EU

Intercity and High-Speed Rail in the EU

In most European countries other than the UK, Sweden, Germany and Italy, intercity passenger rail is still operated entirely by state-owned railroad companies, sometimes as a legal monopoly, although there is often competition for international services (for which open access is now mandatory under EU directives) and there is greater competition for regional and commuter services. Increasingly, intercity passenger services (including high-speed rail) in Western Europe are operated on a purely commercial basis with no capital or operating subsidy "above the rail." Revenues come primarily from passenger fares, and sophisticated market pricing is used, similar to yield management models used in the airline industry. Track infrastructure is still heavily subsidized through a publicly owned entity. Most new lines constructed in recent years in Europe have been high-speed lines built on high-value corridors (e.g., London–Paris/Brussels, with 10 million passengers/year, 30 trains/day). High-speed trains often continue on upgraded conventional lines.

Commuter Rail in the EU

Most commuter and regional rail services in Northern Europe are now operated under some form of contract, increasingly by an operator that has won the contract through a competitive process.

Subsidies for commuter and regional rail are mostly funded from general government revenues. Increasingly these are administered through regional or local governments. For instance, since 2001, the administrative regions of France have been authorized by the central government to manage their own railroad transport services. The administrative regions and the national railroad company agree on contracts stipulating that the national railroad company is required to provide services and the regions pay the company in return. Such contracts sometimes include small investments in local railroad infrastructure.

[9] Report from the European Commission on monitoring development of the rail market, 2012. http://ec.europa.eu/transport/modes/rail/market/doc/swd(2012)246_final-2_-_annex_to_the_report.pdf

Australian Rail Sector Context

Prior to the 1970s, railroads in Australia were mostly owned and developed to serve the needs of a single state, as vertically integrated systems (with the state owning and operating both infrastructure and rolling stock). There were limited interconnections between railroads, and the various state systems even used different track gauges.

In the 1960s, development of a national freight system began, including harmonization across gauges. From 1970, a standard gauge link allowed the same train to run from Perth to Sydney, and later standardization linked Melbourne and Brisbane. Isolated private railroads were also developed to exploit large iron ore deposits in North Western Australia. State-owned rail infrastructure is open access by law. The interstate lines and connecting state networks now have complete vertical separation, with state ownership of rail infrastructure and open access to private operators based on published and regulated access charges.[10] In limited instances, the state infrastructure systems were also privatized. For example, the public narrow-gauge lines in Western Australia were acquired by Aurizon,[11] which must also allow open access. The Tasmanian Railway was concessioned from 1997 to 2009 and reintegrated in public hands in 2010 and has only one public operator at present.

The primary rail systems are as follows:

- The Australian Rail Track Corporation (ARTC), owned by the national government, owns, leases or has contracted to manage access to over 8,500 km of standard gauge track across the country.
- The Queensland Rail (QR) narrow-gauge system is publicly owned by the State Government of Queensland and covers much of the network running north from Brisbane.
- A number of privately owned lines but with fully open access.
- A number of isolated, fully private and dedicated freight lines, largely catering to the resources sector with no requirement for open access.

Rail Infrastructure Context in Australia

The Australian Government (through the ARTC) plays a significant role in providing infrastructure funding for freight rail, unlike the United States where most rail infrastructure is privately owned and maintained. ARTC's mandate is "to increase the volume of freight carried by rail and to do so in a commercially sustainable way."[12] The ARTC network also provides access for interstate and intercity passenger rail services. ARTC publishes access charges for passenger and freight operators over its entire system. These access charges are filed with government (the owner) and are calculated per train-km and per gross tonne-km. They are differentiated by passenger versus freight, by type of passenger or freight traffic, and by specific lines within the network. ARTC's access charge revenues cover recurrent expenses and allow some surplus for renewals and other works, but government funds most major investments and upgrades through general taxes.[13] The ARTC funds infrastructure improvements, which will specifically benefit import and export freight, for example. In turn, the ARTC publishes access charges for passenger and freight operators over its entire system,[14] which are calculated on a per-train-km and per gross tonne-km basis, and which differentiate by type of passenger or freight traffic, and by specific lines within the network.

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[10] Here state ownership includes ownership by individual Australian states, or by the national government. The Adelaide-Darwin railway line was built in a BOOT process and is in private management for the term of the agreement (till 2060).

[11] Aurizon is the new name of the freight operator portion of Queensland Railways. Queensland Railway was reorganized with the state of Queensland keeping ownership and responsibility for rail infrastructure in Queensland and Aurizon offering rail operations services, which in some cases include operation and maintenance of infrastructure.

[12] ARTC Annual Report 2012, page 3.

[13] World Bank, "Railway Reform: Toolkit for Improving Rail Sector Performance," June 2011.

[14] The Australian Rail Track Corporation (ARTC), owned by the Commonwealth Government, owns, leases or has contracted for access to a national network of standard gauge lines spanning the continent from Perth to Brisbane (via Adelaide, Melbourne and Sydney) and from the North (Darwin) to a connection with the transcontinental line at Tarcoola.

Overall, through ownership of ARTC and through funding in the rail activities of the Nation Building Program (which covers all modes), the government has clearly defined the public interest needs for rail infrastructure capacity, and has moved to ensure that these needs are financed. ARTC's revenues come primarily from track-access charges, as well as contract maintenance activities for the Country Regional Network in New South Wales. The ARTC's operating revenues have typically fallen short of operating expenses, however, and over the 14-year period (financial years 1999 to 2012) accumulated operating losses have been AU$818 million (US$743 million). Over the same period, government grants and other support have totaled AU$1,020 million ($US926 million).[15]

The QR Network, a wholly owned subsidiary of QR, is responsible for providing, maintaining and managing access to, and operations on, the QR rail network. The QR Network is ring fenced from all operators and offers open access to all operators. Network access charges are based on per gross tonne-km and per trip along with a charge per tonne handled.

Privately owned lines with fully open access include the narrow-gauge lines acquired by Aurizon in Western Australia, and the recently built "Northern Line" between Tarcoola and Darwin, which is now owned by Genesee and Wyoming. These lines publish minimum and maximum charges per gross tonne-km, with actual charges negotiated with each operator. The level of these charges is not public but is regulated by the states.

Freight Rail Context in Australia

Freight rail companies in Australia are largely self-financing and require no direct public funding support.

The completely market-driven, shipper-owned private freight railroads (infrastructure and operations) finance their infrastructure needs through commercially generated revenues and private finance without public intervention. Many of the dedicated rail lines in Western Australia serve companies operating in a largely booming world commodities market and have low production costs. These lines typically have no significant connections to the rest of the network and are effectively conveyor belts for the mining companies that own them. Approximately 50% of Australia's total rail tonnage is carried by these private, dedicated railroads owned by mining companies in Western Australia.

The privatization of the freight operators running on publicly owned infrastructure has largely been successful, apparently generating sufficient internal financing for operating needs. This conclusion is supported by the fact that there has been continuing interest in mergers and acquisitions of the freight operators. There are now four major privately owned operators (Pacific National, Aurizon, Genesee & Wyoming Australia, and Qube Logistics) as well as a number of smaller, private tenant operators.

The privately owned Western Australia lines and the Northern Line (Tarcoola to Darwin) publish minimum and maximum charges per gross tonne-km, with actual charges negotiated with each operator on a confidential basis.

Passenger Context in Australia

Intercity Passenger Rail in Australia

Intercity passenger trains largely run on rail networks owned and maintained by public authorities, with QR Network in the north-east of the country and ARTC maintaining the majority of

[15] Australian Rail Track Corporation Ltd Annual Reports for 1999 through 2012.

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the networks used by intercity rail services. Passenger train operators pay track-access charges to QR Network, ARTC or other infrastructure-owners, as the case may be.

There are three long-distance interstate trains in Australia. Two of these (The Ghan and Indian Pacific) operate without operating subsidy by a private company, Great Southern Railways, following privatization in 1998. A third line (The Overland) also operated by Great Southern Railways, operates a limited schedule with a subsidy from two state governments (Victoria and New South Wales).

The remaining intercity trains are largely combined with commuter (intra-state) services, including the New South Wales CountryLink services, V-Line in Victoria, and various long-distance intercity and sleeper train services operated in Queensland. Passenger operations are all subsidized by the state governments. The busiest intercity corridor falls within the New South Wales CountryLink services, and it does cross state boundaries, linking the capital cities of each state (Melbourne—Sydney—Brisbane). However, the relatively short cross-border extensions linking with Brisbane and Melbourne are understood to be operated on a commercial basis and incremental revenue more than covers incremental costs.

High-Speed Rail in Australia

Like the US there have been a number of HSR programs proposed over the past 20 years in Australia, although none are currently being developed. In April 2013, the national government published the High-Speed Rail Phase 2 Report,[16] which proposed that a dedicated HSR network be developed across approximately 1,750 km between Brisbane-Sydney-Canberra-Melbourne, at an estimated construction cost of AU$114 billion (US$105 billion) (2012 dollars).

It is expected that the government will be required to cover the majority of upfront capital costs. Once in operation, it is believed that the HSR system may be capable of generating sufficient revenue from fare and other sources to meet its operational and asset renewal costs without being dependent on a government subsidy. [17]

Commuter Rail in Australia

All of Australia's major cities have commuter rail systems (Sydney, Melbourne, Brisbane, Perth, and Adelaide). These operate over rail infrastructure networks owned and maintained by state-owned entities. In most cities, large sections are electrified with city center tunnels and underground stations. These operations are typically subsidized. In Sydney, for instance, fare revenues cover about one-third of total costs, including operations and maintenance; the balance is funded largely by government.

Japanese Rail Sector Context

Japan has the oldest and one of the largest and most well-established high-speed rail networks in the world (Shinkansen network), with over 2,600 km of track with maximum speeds of between 260 km/h and 300 km/h.

Infrastructure Ownership

Ownership of high-speed line infrastructure that existed before rail sector privatization (in 1987) rests with four Japan Railways (JR) passenger companies, fully private integrated operations responsible for both railway operations and infrastructure management.

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[16] Australian Government, Department of Infrastructure and Transport, "High Speed Rail Study Phase 2 Report," April 2013. http://www.infrastructure.gov.au/rail/trains/high_speed/

[17] Australian Government, Department of Infrastructure and Transport, "High Speed Rail Study Phase 2 Report," April 2013. http://www.infrastructure.gov.au/rail/trains/high_speed/

New HSR infrastructure constructed following privatization is financed entirely by the government and owned by the Japan Railway Construction, Transport and Technology Agency (JRTT), a subsidiary company of the national government.

Passenger Rail Operations

The private JR companies must pay a rental fee (similar to an access charge) for any new lines constructed by JRTT. The rental fees are fixed for 30 years and are calculated based on the anticipated difference in profit the JR company will make from the existence of a high-speed line (in comparison to if there was no high-speed line). This approach is based on the policy that the national government should not threaten the JR companies' profitability, particularly given the history of financial challenges faced by railway operating companies prior to privatization. Any construction and maintenance costs not covered by the rental fee are paid for by the national and local governments.[18]

Freight Rail Operations

The Japan Freight Railway Company (JR Freight) was also created through privatization, at the same time as the passenger JR companies. It owns very little track of its own, and primarily uses and pays for access to track owned by JP passenger railway and other companies.

[18] Yanase, Naoto. "Track Access Charges for Japanese Shinkansen," 5 March 2012. Part of report by International Union of Railways (UIC), "Infracharges: UIC Study on railway infrastructure charges in Europe," November 2012.

APPENDIX E

Case Studies on Potential Application of Alternative Funding and Financing Mechanisms

Case Study (High-Speed Rail): California High-Speed Rail Program

Project Overview

There have long been proposals for HSR systems in California, dating as far back as the 1970s. In 1996, the legislature established the California High-Speed Rail Authority (HSRA), and charged it with developing proposals suitable for submissions as a ballot measure.[1]

The HSRA issued its first comprehensive proposal in the form of the 2000 Business Plan.[2] This plan recommended a 703-mile system linking Sacramento, San Francisco, Los Angeles and San Diego, generating about 30 million passengers annually, at a capital cost of $25 billion (2011$). These conclusions formed the basis of "Proposition 1A" (also called Assembly Bill 3034), which was supposed to be put to voters in 2004. It was delayed twice by the legislature before being eventually passed with nearly 53% of the vote in 2008. Proposition 1A established the plans and requirements for the HSR system, and provided up to $9 billion in bonding authority to meet the state's share of what was expected (or hoped) to be a program funded in conjunction with local, federal and private sources.

Based on this legislation, the HSRA issued its 2008 Business Plan for a 520-mile system,[3] generating between 39.5 and 54.6 million passengers,[4] at a cost of $34.7 billion (2011$). Proposition 1A authorized up to $9 billion in bonding authority to be issued by the state.[5] It also required that bond money be matched by 50% from other sources. No such sources were available on any significant scale at the time, and the 2008 collapse of the national economy made the funding situation even more challenging.

The passage of the American Recovery and Reinvestment Act of 2009 (ARRA) changed the situation dramatically, with President Obama making HSR a signature initiative and including $8 billion within ARRA specifically to HSR initiatives. Thanks to the ARRA, the HSRA had access to $6 billion

[1] California allows measures (usually called Propositions) to be taken directly to the people, bypassing the Legislature.
[2] CA HSRA, "2000 Final Business Plan," June, 2000, see pages E-7 and E-14. Business Plans beginning in 2008 are available on the HSRA's website at http://www.hsr.ca.gov/Newsroom/studies_reports_archives.html. The 2000 Business Plan is apparently no longer available from the Authority, but is available from the author.
[3] Links to Sacramento and San Diego were excluded, to be considered in subsequent phases.
[4] The demand estimates were based on two approaches. The higher estimates refer to ridership when train fares are 50% of airfares, the lower estimates refer to ridership when train fares are 83% of airfares. The 50% approach in effect produces maximum public benefits but requires more public investment, whereas the 83% approach would increase the possibility of private participation. In fact, a truly private investor might well charge as much as air and would differentiate markets.
[5] An additional $950 million in bonding authority was made available for local and intercity rail projects that improved connectivity to the HSR system.

within its sights within a year ($3 billion from ARRA grants,[6] and $3 billion from matching Proposition 1A bonds). At this stage, the HSRA issued a 2009 Business Plan, for a 520-mile project costing $36.9 billion with projected demand of between 41–58 million passengers.

Despite this potential availability of funding to get the project started, the HSRA did not make much immediate progress. This was due to a number of factors, including the inherent complexity of the project, especially the environmental analysis and clearance process, as well as the gubernatorial political transition from Arnold Schwarzenegger to Jerry Brown in early 2011.

After further analysis, the HSRA issued a revised 2012 Business Plan in which expected ridership demand was reduced to between 26.4 and 50 million passengers, with capital costs of $57.9 billion. In June 2012, legislation (SB 1029) was passed to permit the HSRA to move ahead with design and contract advertisement. The intention is to award an initial management contract to operate early parts of the system and then move to a franchise or concession when the system has increased connectivity.

The Final 2014 Business Plan was issued on April 30, 2014 (www.cahsr.ca.gov), in which the project continues to evolve. As currently planned, the system will be built in two phases, each with several stages. These phases/stages are illustrated in Figure E-1. Phase 1 will essentially link Anaheim and San Francisco, while Phase 2 would add links to Sacramento and San Diego (via Riverside). Capital cost for Phase 1—scheduled for completion in 2029—is estimated at $54.9 billion ($2013) with passenger demand of 34.9 million.

Funding Requirements

The overall capital cost for Phase 1 of the 2014 Business Plan is $54.9 billion ($2013), with three stages broken down in Table E-1.

Estimated capital costs of $54.9 billion are in 2013 constant dollars. Taking into consideration inflation over the construction period (to 2029) and assumptions employed in the estimates (+/−10%), the total cost could increase to as much as $75 billion.[7]

Anticipated Funding Model

The funding model for the HSR is still under development, though the intention is ultimately to involve a mixture of public funding and private finance.

Currently, against the $54.9 billion cost of Phase 1 of the project, the HSRA now has about $5.9 billion available ($2.6 billion from Proposition 1A and $3.3 billion from ARRA funds and other US DOT sources).[8] Proposition 1A has an additional $4.2 billion in borrowing authority pending a match from other sources. Overall, this still leaves a funding gap of about $44.8 billion. There are no other defined or committed sources to fill this gap at present.

[6] HSRA originally applied to the US DOT for about $1 billion in funds. When HSR projects in Florida and Wisconsin collapsed due to political opposition, an additional $2 billion was granted to the HSRA project.

[7] This is why the costs of the project are usually stated both in constant dollars and in year of expenditure (YOE) dollars. Typically, total costs are authorized in dollars of a particular year, while appropriations and borrowing necessarily take place in YOE dollars.

[8] The terms of the agreement with FRA require that Federal ARRA money must be matched from state sources (50/50). Although the FRA has agreed to let the state front-load the federal money and match it somewhat later with state money from Proposition 1A or other sources (such as cap-and-trade), the state will still need to bring matching funding sometime in 2014. The state has faced a number of long-standing lawsuits challenging the HSRA's ability to spend proposition 1A funds, which could delay matching disbursement.

Source of map: 2014 Business Plan (www.cahsr.ca.gov)

Figure E-1. High-speed rail in California.

Table E-1. Capital costs for phase 1 of California HSR (to be completed by 2029).

Phase 1 Stage	Description	Capital Cost ($2013 billions)
Initial Operating Section (IOS)	Central Valley Section extending into San Fernando Valley just north of Los Angeles, and including early investments in the Caltrain and Metrolink corridors (the "bookends").	27.8
Bay to Basin	Linking Central Valley to San Jose.	14.7
Complete Phase 1 Blended Operation	Complete links from San Francisco through to Los Angeles and Anaheim.	12.4
Total Cost (Phase 1)		54.9

Source: Draft 2014 Business Plan, pages 16, 34 and 35

Potential for Alternative Funding and Financing Mechanisms

Table E-2 indicates how the funding and financing mechanisms could apply to support funding of the California HSR system.

Case Study (Intercity Rail): Amtrak Virginia—I-81/ Route 29 Corridor

Project Overview

Highway congestion is a major issue in Virginia, particularly along the corridors connecting Northern Virginia with Washington DC. In part as a result of this highway congestion—as well as increasing fuel prices—ridership on intercity (and commuter) rail services has increased

Table E-2. Potential application of alternative funding and financing mechanisms for California HSR.

Service or Asset-Related Revenue (Funding) Mechanisms	Potential Application for California HSR
Market Pricing to Maximize Fare Box Revenues (6.4.1)	This question is not resolved. The stated intention of the HSR Authority is to concession the operation of the HSR system to a private operator. The principles under which the concessionaire's pricing will be regulated have not been decided. High potential.
Premium Services to Increase Service Revenues (6.4.2)	Although the existing demand and revenue studies do not include the impact of premium services, it is clear that California will have a stratified market and that there will be a role for various classes of service. Medium potential.
On-board and In-Station Retail Concessions (6.4.3)	Revenue projections recognize this strong possibility, but do not include such revenues in the current financial analyses. Lower potential.
Track Access Charges (6.4.4)	Since HSRA will own most of the infrastructure, there are not likely to be access charge revenues unless HSRA opts for competing HSR operators, which seems unlikely. There is a possibility that HSR trains will need to pay access charges in the shared corridor areas such as San Jose to San Francisco. No potential.

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Table E-2. (Continued).

Service or Asset-Related Revenue (Funding) Mechanisms	Potential Application for California HSR
Selling or Leasing Access to Railroad Rights of Way (6.4.5) (The operator and the owner may be different, which is often true of passenger operators. The benefits go to the owner.)	No revenue is projected for such leases on the HSR ROW, but it is not precluded and may eventually develop once all of the HSR ROW is actually in hand. Medium potential.
Commercial Property Development/Joint Development (6.4.6)	This possibility is explicitly included in HSR planning, though there are as yet no financial projections attached. One potential issue is that local authorities may want a significant role in planning and implementing local development and, since local authorities will be involved in local access planning and parking provision, they will want a share in the development proceeds. Low potential.
Branding, Sponsorship, and Naming Rights (6.4.7)	This source appears to have minimal value for HSR. Low potential.
Public Revenue (Funding) Mechanisms	**Potential Application for California HSR**
Incremental Property Tax Revenues (for Tax Increment Financing) (6.5.1)	A joint program of the HSRA with local authorities to improve local access, develop the property that is improved by HSR access, and maximize the non-passenger values of rail station areas could generate significant funding, though it will be shared with local authorities and thus not fully available for construction and operation of the HSR system. Although a Tax Increment Financing approach supported financing of the Bay Area Rapid Transit (BART) system, it is not currently under review for HSR. It is possible that it will be used eventually to raise a part of the state's share of the project costs. Medium potential.
Special Assessment District (SAD) Fees (6.5.2)	These are in use for local transit in California, but have not been considered for HSR. Residents and businesses in the area of HSR may not see the day-to-day benefits of the HSR station necessary to justify such fees (for example, in comparison to SAD fees for a new water system). Low potential.
Impact Fees Charged to Property Developers (6.5.3)	Not under consideration as development related to HSR is not fully defined. Future use is possible in specific situations such as around new HSR stations. Medium potential.
Station Parking Charges (6.5.4)	Station parking charges are explicitly part of the HSR plans, though no revenue estimates are included in current plans. The issue will be what share of parking investment and revenues will be allocated to local authorities as opposed to HSR. Low potential.
Road Tolling/Congestion Charging (6.5.5)	Road tolls and road congestion charging are not likely to be used to support HSR investment or operating costs, but they could well increase demand for HSR service and thus support HSR indirectly. High potential but unlikely.

Table E-2. (Continued).

Public Revenue (Funding) Mechanisms	Potential Application for California HSR
Heavy Goods Vehicle (Truck) Charges (6.5.6)	Not applicable. No potential.
Gas Tax (6.5.7)	Gas taxes would be a feasible way to finance HSR, but political opposition to any increase in gas taxes is very strong (at the state and federal level) and may make increases, especially any increase hypothecated to HSR, impossible. For example, a 20-cent increase/gallon (the current price in California is about $3.80/gallon) would raise about $3.4 billion annually. An annual input at this level would fully pay for construction of the system over about a 20-year period. High potential but unlikely.
Car Registration Plate Auction (6.5.8)	Given California's attachment to autos, this would be politically infeasible and has not been considered. High potential but unlikely.
Motor Vehicle Registration Fees (6.5.9)	Very recently, a well-known group, Transportation California, intended to promote a Proposition in the upcoming 2014 elections that would have raised the vehicle registration fee. The campaign was halted because the prospects for passage were too low. It would be even harder to use such an increase to support HSR. High potential but unlikely.
Vehicle Mileage-Based User Fee (6.5.10)	A vehicle mileage-based tax could be a feasible way to finance HSR. But, like fuel taxes, there is likely to be significant political opposition. California often is ahead of other states in the application of public policies to reduce congestion and improve air pollution. A vehicle mileage-based tax is regarded as an efficient and effective way to generate revenue for transportation projects and offers a mechanism to establish congestion pricing regimes. It is possible that California could implement such a system. A vehicle mileage user fee could generate large amounts of funding – a 1 cent per mile fee would raise about $3.2 billion annually. High potential, uncertain probability.
Payroll Taxes Used for Transport (6.5.11)	These have not been considered and would have not been of direct relevance to HSR (more relevant for commuter services with defined beneficiaries). Low potential and unlikely.
Sales Tax (6.5.12)	The 2000 Business Plan of the HSRA suggested a 1/4 cent addition to the statewide sales tax on all items. This would have been sufficient to finance the full capital cost of the project as then envisioned. Given current projections, this might need to be raised to 1/2 cent. A tax at this rate would finance a major part of the state share of the project. The possibility has not been considered since the 2000 Business Plan. High potential but unlikely.
Carbon Tax or Credits (Cap-and-Trade) (6.5.13)	The 2014 budget allocates $250 million from the state's Cap-and-Trade program to fund the HSR system along with 25% of the proceeds in future years. If the use of such funding continues, it will give the HSRA a dependable source of funding, though not sufficient to fill the gap. The current Cap-and-Trade system will generate a total of $2 billion annually, but this will rise to $4–$5 billion annually when motor fuels are added to the required emission permit market. Also, Cap-and-Trade will not fully finance the building of the $60 billion HSR system unless virtually all of the program receipts are dedicated to this purpose, an outcome that is very unlikely politically since there are many other claimants for the funding (e.g. solar energy, social programs, etc.). The argument has also been made that HSR is not the most effective way for the Cap-and-Trade Funds to reduce CO_2 emissions. High potential but full availability of cap and trade for HSR is unlikely.

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Table E-2. (Continued).

Financing Mechanisms	Potential Application for California HSR
Public-Private Partnerships (PPPs) (6.6.1)	The HSRA has argued that the operation of Phase 1 will generate significant positive cash flow that can be used for project finance or as a way of attracting investment from a concessionaire. Experience with HSR in other countries has shown that HSR systems can generate positive operating cash flows, in many cases sufficient to finance rolling stock investments and in some cases sufficient to generate some contribution to the investment cost of the infrastructure.[9] The role of the private sector in California will depend strongly first on the passenger demand and revenues and second on the business model adopted by the HSRA. The more the HSRA can finance at the outset and prove actual demand (as opposed to the demand models that are inevitably speculative for a system not yet in operation), the more the private sector will be willing to offer services for the right to operate the system; but this obviously limits the investment role of the private sector in building the system initially. At the same time, if the HSRA does build the system with public money, it will necessarily have made a series of technology and design decisions about equipment design, operating speeds, schedules and capacity that might not fully match the market judgments of an experienced commercial operator; this could easily reduce the value to a private franchisee of operating the system. Potentially more important, the HSRA will eventually need to decide whether and how to regulate the fares and services of a concessionaire: low fares and maximum services would maximize the ridership and economic benefits of the project, but would reduce financial performance and the potential contribution from the private sector. Giving the concessionaire full control over fares and services would permit the maximum financial performance and financial contribution, but reduce public benefits from social benefits such as reduction of emissions, congestion and accident costs. If the Authority eventually has the resources to finance the full system from public sources, it might be able to opt for the low fares and maximum services: if it needs to maximize the private investment role, then more control will have to be given to a private operator. This will only become clear as the actual business model evolves, but it is clear that there is a strong interaction between business models and the financial contribution that can be developed from the private partners in PPPs. High potential.
Equipment Trust Certificates (available to private companies) (6.6.2)	These will almost certainly be used to finance the HSR rolling stock, especially if the rolling stock is provided by a private concessionaire. High potential.
Operating Lease Certificates (available to private and public companies) (6.6.3)	Some part of the HSR system, for example to connect from the 4th and King Caltrain station to the TransBay Terminal in downtown San Francisco, may be managed under an operating lease. In addition, depending on agreements reached, HSR may lease or own their parts of stations that are also served by local operators (Caltrain, ACE and Metrolink). High potential.

[9] See, for example, Chapulut, Jean Noël and Jean-Pierre Taroux, "Trente Ans de LGV: Comparaison des Prévisions et des Réalisations," Transports, Number, 462, Juillet-Août, 2010 and Crozet, Yves, "High Speed Rail Performance in France: From Appraisal Methodologies to Ex-post Evaluation," OECD, ITF Discussion paper 2013–26.

Table E-2. (Continued).

Financing Mechanisms	Potential Application for California HSR
Finance or Capital Leasing (private and public companies) (6.6.4)	This approach has been employed in France where the private sector built some TGV sections and then in effect leased them to SNCF. The CA HSRA does not have the authority to enter into such long-term leases that would commit the state for periods well beyond existing appropriation authority. High potential but not possible under current law.
Bonds with Public-Sector Backing (6.6.5)	This is the essence of the Proposition 1A approach. Under current law, the amount is limited to $9 billion, and it is hard to see how this limit could be increased. The HSR project might qualify for some federal bonding guarantees or sources (RIFF Loans) but no application has been filed, and the HSRA would not have a clear ability to repay such loans from revenues (and has no authority to commit the state to repay). Low potential.
Corporate Bonds (available for private entities) (6.6.6)	This form of financing will be available to the private concessionaire operating the system, but not to the HSRA. High potential if concessioned.
Mezzanine Financing (available to both private and public companies/authorities) (6.6.7)	This may well be used by construction contractors to finance their outlay between compensation periods from the Authority. High potential.
Short-Term Corporate Line of Credit Financing (6.6.8)	Once construction has started, many construction firms will use corporate line-of-credit financing to provide start-up funds for construction. The use of this source will require either signed contracts for HSR work or other sources of corporate revenue on which lenders can rely for security.
Sale of Stock (Ownership Stake) (6.6.9)	This might well be a source of financing for a concession operator, or for certain sub-developments similar to Washington DC's Union Station. Medium potential.
Tax/Investment Credits (6.6.10)	Sale of tax loss carry-forwards was used by Amtrak to finance equipment. The HSRA might eventually generate such benefits. Medium potential.

in recent years. Amtrak ridership in Virginia grew 77% between 2004 and 2012 (much more than the 24% ridership increase Amtrak experienced on the national system over the same time period).[10]

The Virginia 2008 Statewide Rail Plan and Statewide Rail Resource Allocation Plan identified the I-81/Route 29 corridor which connects Washington DC and Lynchburg as one of two key corridors[11] on which to enhance intercity passenger rail services and help alleviate road congestion on the highway network.[12] Passenger rail service improvements along this corridor are being implemented through a six-phase program, as follows.[13]

- Phase I: In 2009, Virginia partnered with Amtrak to provide a new state-supported train service between Washington DC and Lynchburg (approximately 180 miles).The partnership, Amtrak Virginia, which operates on Norfolk Southern track, currently offers two round trip trains per day. The service has been very successful and is now one of Amtrak's highest

[10] Virginia Department of Rail and Public Transportation, "2013 Virginia Statewide Rail Plan," November 2013, page ES-11.
[11] The other corridor runs along the I-95 connecting Washington DC to Richmond and beyond.
[12] http://drpt.virginia.gov/projects/tdx.aspx
[13] 2013 Virginia Statewide Rail Plan, November 2013, page 5-13.

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performing routes—ridership levels in 2010 and 2011 surpassed estimates by 260% and 140%, respectively.[14] The service is also one of the few Amtrak routes outside of the NEC that covers its direct costs through fares. According to the state's most recent Six Year Implementation Plan (2014–2019), operating revenues for this service are expected to exceed operating costs every year, generating an operating surplus of $1.5 million by the end of FY2019.[15] The actual annual operating profit for Phase I in 2013 was $600,000. No other Amtrak service in Virginia is expected to generate an operating surplus over the same timeframe.

- Phase II: A new passenger rail service is being added between Lynchburg and Roanoke (approximately 55 miles).[16] This phase of work is now underway, with design and construction work proceeding in order to start services by 2017.[17]
- Phase III: This phase will involve capacity improvements to extend passenger rail service from Roanoke to Bristol (an additional 150 miles).
- Phase IV: Involves capacity improvements and additional train sets to accommodate new roundtrip trains from Washington DC to Lynchburg.
- Phase V: Capacity improvements and additional train sets to accommodate two roundtrip trains from Washington DC to Bristol.
- Phase VI: Capacity improvements to establish a new east-west passenger service from Lynchburg to Richmond.

Figure E-2 illustrates the existing Amtrak services on the corridor as well as planned services: Phase I (yellow), Phase II "near-term" passenger services (green), and Phases III-VI long-range passenger services to be studied (red).

Anticipated Funding Requirements

The estimated total project cost for Phases I-VI is $513.8 million, per Table E-3.

Phase I (new service from Washington DC to Lynchburg) is already fully funded and now operational. Phase II (rail connection from Lynchburg to Roanoke) also has full funding in place.[18] Of the estimated $128.4 million in capital costs for Phase II, the Commonwealth of Virginia is contributing $95.7 million, the majority of which is being provided through revenues from the Intercity Passenger Rail Operating and Capital Fund (IPROC). Phases III-VI are not yet under detailed study and are currently unfunded.

Anticipated Funding Model

Virginia has been at the forefront of implementing intercity passenger rail funding solutions. In particular, the state acted quickly to establish funding approaches to enable it to meet

[14] Virginia Department of Rail and Public Transportation, "2013 Virginia Statewide Rail Plan," November 2013, page ES-12.
[15] Virginia FY2014 Six Year Implementation Plan, "Intercity Passenger Rail Operating and Capital Program" table. page 74.
[16] There has been no Amtrak service between Lynchburg and Roanoke in more than 30 years. Currently, Amtrak operates a connecting bus service from Lynchburg to Roanoke (55 miles) and Blacksburg (an additional 40 miles). The bus costs $4 each way.
[17] In January 2014, State Governor Bob McDonnell announced an agreement between the state and Norfolk Southern to extend Amtrak passenger rail service from Lynchburg to Roanoke. Included in the agreement are track additions and realignments, signal and communication upgrades along the route, clearance adjustments, and a platform and train servicing facility in downtown Roanoke. Design work is beginning immediately, and services are expected to commence by fall 2017. http://www.newsadvance.com/news/local/lynchburg-roanoke-amtrak-rail-service-agreement-announced/article_5e99ad08-7949-11e3-ae46-001a4bcf6878.html
[18] The state of Virginia is expected to provide $92.7 million, including $10 million to help the city of Roanoke build a station, platform and track, including terminal train storage and servicing facility. The City of Roanoke is responsible for the station building and parking facilities. Under a separate agreement, Virginia is providing $3 million towards the estimated $6 million cost of a culvert to carry the Trout Run stream beneath the proposed station platform and track facility in Roanoke http://www.newsadvance.com/news/local/lynchburg-roanoke-amtrak-rail-service-agreement-announced/article_5e99ad08-7949-11e3-ae46-001a4bcf6878.html

Source: Virginia Rail Resource Allocation Plan, 2013, page 43
http://www.drpt.virginia.gov/activities/files/Final%20RAP%202013.pdf

Figure E-2. US 29, US 46 and I-81 passenger services and planned improvements.

Table E-3. Project phasing and costs, US 29, US 460 and I-81 passenger service.

Phase	Cost ($2012 estimates)
Phase I: New service between Washington DC and Lynchburg VA	$2 million operating cost, $103.7 capital cost (total of $105.7 million, between FY 2013-2018)
Phase II: Adding a passenger service between Lynchburg and Roanoke	$128.4 million in capital; $6.4 million operating
Phase III: Capacity improvements will extend passenger service to Bristol	$47.7 million (capital)
Phase IV: Capacity improvements and additional train sets to accommodate two roundtrip trains to Lynchburg	$91.3 million (capital)
Phase V: Capacity improvements and additional train sets to accommodate two roundtrip trains to Bristol	$110.0 million (capital)
Phase VI: Capacity improvements to establish passenger service from Lynchburg to Richmond	$24.5 million (capital)
Total Cost	$513.8 million

Source: 2013 Virginia State Rail Plan, Page 5-13.

Section 209 of PRIIA,[19] which states that Amtrak (effective October 2013) is precluded from operating any regional passenger services unless the required subsidy to operate those services is funded by the state. As a result of this change, Virginia needed to decide how to continue to fund the operating costs of its six existing regional Amtrak services in the state, or risk losing the services altogether. The government moved very quickly (particularly relative to other states) to establish sustainable, dedicated state revenue sources for the continuation and expansion of existing and future regional intercity passenger rail operations.

The funding model for Phases I-VI includes a combination of state, federal, private railroad, local jurisdiction and nongovernmental funding sources, as described below. [20]

Sources of State-Level Funding

- Intercity Passenger Rail Operating and Capital Fund (IPROC): The most significant (and innovative) approach to increase state-level funds for intercity passenger rail services in Virginia was the creation of IPROC in 2011.[21] This is a special non-reverting fund (funds never revert back to general fund) within Virginia's Transportation Trust Fund. IPROC established a legislative basis to fund Virginia-sponsored regional passenger rail operations and, in 2013, Virginia passed legislation[22] to create a sustainable revenue stream for IPROC through allocating a portion of Retail and Sales Use Tax to IPROC. Specifically, in July 2013, the state raised the Retail and Sales Use Tax rate by 0.3% statewide, with an additional 0.7% increase in Northern Virginia and Hampton Roads districts.[23] Of this increase, 0.125% was allocated to transportation funding: 40% to IPROC and 60% to the Mass Transit Fund. Committing this portion of Retail Sales and Use Tax revenue to IPROC is expected to yield $44 million for IPROC in 2014, with growth expected to reach $56 million annually by 2018, representing an increase in rail funding of 86% compared to 2013.[24, 25]
- Rail Enhancement Fund (REF). Created in 2005, the REF is the primary source of state funding for implementing large capital improvement projects for freight and passenger rail (including commuter rail).[26] It is a grant program with funding provided based on a public-benefit analysis. Any funding requires a minimum 30% match from non-state sources. The REF is primarily used for capital funding (though exceptions to subsidize operating costs are possible through special appropriation of the General Assembly).[27] The primary source of revenues for the REF is receipt of 3 cents from the vehicle rental tax (currently 10 cents), which generates approximately $27 million annually. The REF also receives some funds from Capital Project Bonds—see below (approximately $12–$13 million/year).

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[19] PRIIA (Section 209) requires that states must now pay operating and capital costs on a fully allocated basis for intercity rail service on Amtrak routes that are either state requested, on designated high-speed rail corridors (outside of the NEC), short-distance corridors, or routes less than 750 miles.

[20] Virginia Statewide Rail Plan, November 2013, Pages 4-2 to 4-7. See also: Commonwealth Transportation Board, "FY 2014 Rail and Public Transportation Improvement Program" (Six Year Implementation Plan).

[21] §33.1-221.1:1.3.

[22] "Virginia's Road to the Future" (HB 2313).

[23] Retail Sales and Use Tax in the state ranges from 5.3%–6% for most purchases. Virginia Department of Taxation http://www.tax.virginia.gov/site.cfm?alias=changesandupdates#RetailSalesUse

[24] 2013 Virginia Statewide Rail Plan, November 2013. Page 4-2.

[25] IPROC funds can be used to support capital and operating costs, including: the cost of operating intercity passenger rail service; acquiring, leasing, and/or improving railways or railroad equipment, rolling stock, rights-of-way, or facilities; or assisting other appropriate entities to acquire, lease, or improve railways or railroad equipment, rolling stock, rights-of-way, or facilities for intercity passenger rail transportation purposes. https://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+33.1-221.1C1.3

[26] Eligible expenses include: preliminary service, engineering or feasibility studies; final engineering; permitting; acquisition, leading or improvement of rights of way or facilities; environmental mitigation directly related to the project; site preparation; acquisition, lease or improvement of railroad equipment and rolling stock; public involvement expenses.

[27] For example, the Virginia-funded Amtrak services were provided with $6 million from the REF in 2010, and $26.1 million of REF funds are also being used in 2013 and 2014 for IPROC.

- Virginia Shortline Railway Preservation and Development Program (Rail Preservation Program - RPP). This program provides state financial support to preserve, continue and increase the productivity, safety and efficiency of short line railways in Virginia. Though it does not explicitly provide capital funding for passenger rail operations, the funding of infrastructure improvements for the short lines in the state has also benefited passenger rail services (most recently around Lynchburg). The fund requires 30% matching from local jurisdictions and/or the short line railroad. The fund receives $3 million annual allocation of highway construction funds, as well as the interest earned on cash balances to fund short line rail improvement projects.[28]
- Transportation Capital Bond Fund (Project Bonds): These bonds for capital costs of transit and rail improvements (passenger and freight) were established by the General Assembly in 2007 through HB3202. The bond package includes a minimum of 4.3% of available bond funds specifically for rail transportation. Projects funded with Capital Bonds Proceeds are administered through the REF or RPP. The bonds cannot be used for passenger rail operating costs. Passenger rail projects with capital bond proceeds are administered through the REF.
- PPP Financing Options: The state expects the PPP approach to be used more widely for passenger rail going forward, particularly for projects such as passenger rail stations or dedicated passenger corridors. This could potentially include Phases III-VI of Amtrak I-81/US29.

Federal Level Funding Sources

Federal funding for intercity passenger rail services is overseen by the US DOT FRA. PRIIA 2008 authorized more than $3.7 billion to promote improvement of intercity passenger rail operations, facilities and services, as well as high-speed corridors. PRIIA established a number of new competitive grant programs, each of which provides up to 80% of funding from the federal government with the remaining 20% coming from non-federal sources.

Potential Application of Alternative Funding Generation and Financing Mechanisms

Although Phases I and II of Virginia's passenger rail improvement program are fully funded, studies to implement Phases III-VI are still under consideration, and presumably additional funding will be required for these phases.

The state is already using a number of innovative approaches to supporting intercity passenger rail, most notably through allocating a portion of Retail and Sales Use Tax for IPROC. Table E-4 presents potential additional sources for funding which could be used by Virginia to progress in development of the I-81/US 29 corridor.

Case Study (Commuter Rail): Virginia VRE Commuter Service

Project Overview

Established in 1992, Virginia Rail Express (VRE) is the State of Virginia's only commuter rail service. It includes two routes: The Manassas Line running between Washington DC Union Station and Broad Run/Airport, and the Fredericksburg Line running between Washington DC

[28] Report of the Department of Rail and Public Transportation—Commonwealth of Virginia, "Funding Strategies for State Sponsored Intercity and High Speed Passenger Rail [SJR 63 (2010]." Senate Document No. 14. November 2010.

Table E-4. Potential application of alternative funding and financing mechanisms for Amtrak Virginia.

Service or Asset-Related Revenue (Funding) Mechanisms	Potential for Amtrak Virginia Services
Market Pricing to Maximize Fare Box Revenues (6.4.1)	Amtrak already has full control over the fares it collects from passengers, and is free to use market-pricing principles. Whether more revenue can be generated from market-pricing principles (e.g. through yield management approaches) would require further study. Medium potential.
Premium Services to Increase Service Revenues (6.4.2)	Amtrak already offers premium services (Business Class) for passengers on the Amtrak Virginia service. Low potential.
On-board and In-Station Retail Concessions (6.4.3)	Given the growing passenger ridership, and the increasing length of the Amtrak Virginia service (in terms of miles traveled), there may be scope to increase revenues through on-board retail concessions. One option would be for Amtrak Virginia to look at the November 2013 example that Swiss Railway Company SBB took of partnering with Starbucks Coffee to introduce a coffee and retail shop fully on board an intercity train. With a new station opening in Roanoke (by 2017) there may be scope for Amtrak/State of Virginia to capitalize on in-station retail concessions in and around the station, including from park-and-ride potential. Medium potential.
Track Access Charges (6.4.4)	This is not a potential source of revenue, as Amtrak Virginia does not own any track infrastructure. No potential.
Selling or Leasing Access to Railroad Rights of Way (6.4.5) (The operator and the owner may be different, which is often true of passenger operators. The benefits go to the owner.)	There may be potential to generate revenues from selling or leasing access to Amtrak Virginia property around new station developments, though not along the railroad track (which is owned by freight railroads). The potential for this mechanism depends on who owns the property around new stations. Medium potential.
Commercial Property Development/Joint Development (6.4.6)	The extent of commercial property development depends very much on how such development could generate profits for developers (whether public or private). The potential is likely to be relatively low for Amtrak (in comparison to, say, a much busier commuter transit station which could benefit from significant Transit-Oriented Development). Low potential.
Branding, Sponsorship, and Naming Rights (6.4.7)	This source appears to have minimal value for Amtrak. Branding, sponsorship and naming rights are typically most attractive to private advertisers in very high traffic areas (e.g., inner city commuter/transit stations). Low potential.

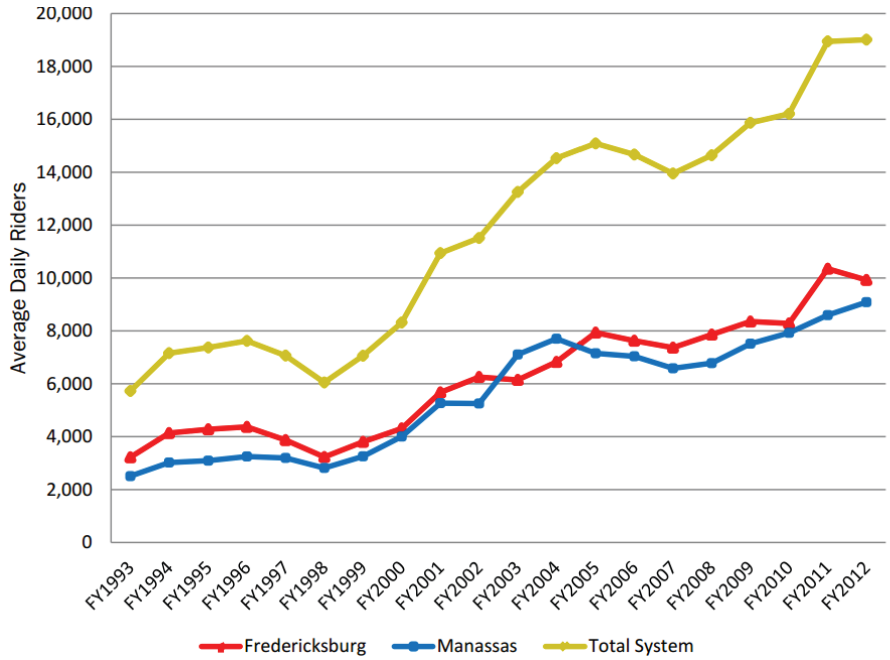
Table E-4. (Continued).

Public Revenue (Funding) Mechanisms	Potential for Amtrak Virginia Services
Incremental Property Tax Revenues (for Tax Increment Financing) (6.5.1)	Collection of incremental property tax revenues for use towards financing of the new stations would likely not be politically acceptable given competing priorities at the local level, and the reality that an intercity rail station would not have a very significant impact on property value (in comparison to commuter / transit stations). Low potential and unlikely.
Special Assessment District (SAD) Fees (6.5.2)	This approach would likely not be relevant for the communities being served by an extended Amtrak Virginia service. Residents and businesses in the area of the new stations may not see the necessary day-to-day benefits of the Amtrak station to justify such fees (for example, in comparison to charging of SAD fees for a new water system). Low potential.
Impact Fees Charged to Property Developers (6.5.3)	The potential for such fees depends on the level of interest from private developers, though major property developments around new Amtrak stations seem limited given the relatively low ridership. Low potential.
Station Parking Charges (6.5.4)	Station parking charges would certainly contribute to supporting the cost of station construction and operation. The issue will be what share of parking investment and revenues will be allocated to local authorities as opposed to the state / Amtrak. High potential.
Road Tolling/Congestion Charging (6.5.5)	Road tolls and road congestion charging could increase state revenues that could be used to help fund rail improvement. This mechanism would also create a disincentive to use personal vehicles, which could in turn generate increased demand and ridership revenues for passenger rail. This is however a broader transport policy question, which would need enabling legislation. This would no doubt be politically sensitive. High potential but unlikely.
Heavy Goods Vehicle (Truck) Charges (6.5.6)	Not applicable. No potential.
Gas Tax (6.5.7)	The state has already increased sales tax to generate funds for intercity passenger rail (through IPROC). An increase in fuel tax could generate additional revenues but may be politically challenging. High potential.
Car Registration Plate Auction (6.5.8)	We are not aware of any plans for such an auction, and given the relatively limited geographic area that would be served by new Amtrak services, an auction seems unlikely to be politically feasible or attractive. High potential but unlikely.
Motor Vehicle Registration Fees (6.5.9)	We are not aware of any plans for such fees. Revenues are already generated for the REF through receipt of 3 cents from the vehicle rental tax (currently 10 cents). High potential but unlikely.
Vehicle Mileage-Based User Fee (6.5.10)	A vehicle mileage-based user fee could raise significant sums – a 1 cent per mile user fee would have raised about $800 million in 2012. The state has already approved many toll roads and is practicing congestion pricing in the Washington area using an EZPass system. A vehicle mileage-based user fee system is possible but politically difficult. High potential but unlikely.
Payroll Taxes Used for Transport (6.5.11)	These have not been considered and would have not been of direct relevance to Amtrak given the relatively limited use of Amtrak for the majority of the population in any given area. Low potential.
Sales Tax (6.5.12)	The IPROC generates significant funds for intercity passenger rail through receipt of a portion of sales tax revenue. This is likely to continue to be the primary stream of funding (after passenger fares) for the foreseeable future. High potential.
Carbon Tax or Credits (Cap-and-Trade) (6.5.13)	Cap-and-trade legislation has been proposed in Virginia in the past, though former bills have not passed and have been opposed by industry (including manufacturers and coal producers). We are not aware of any plans to establish a cap-and-trade system going forward. High potential.

(continued on next page)

Table E-4. (Continued).

Financing Mechanisms	Potential for Amtrak Virginia Services
Public-Private Partnerships (PPPs) (6.6.1)	Virginia's 2005 Public-Private Transport Act (PPTA) is the legislative framework to enable public entities to enter into PPP agreements with private companies. State-level financing for PPPs can include the Transportation Partnership Opportunity Fund (administered by Virginia DOT), the Virginia Transportation Infrastructure Bank (managed by VDOT and the Virginia Resources Authority), and the REF (administered by the Virginia Department of Rail and Public Transportation, or DRPT). The grant funds of the REF have already been used to leverage private finance in PPP projects in the state, including for the Norfolk Southern Heartland Corridor, Crescent Corridor and CSX National Gateway Corridor (though not the Amtrak Virginia services specifically). High potential.
Equipment Trust Certificates (available to private companies) (6.6.2)	This financing approach (e.g. for new rolling stock) is not likely to be an option for Amtrak Virginia, as such certificates are typically restricted in terms of availability to private companies. Low potential.
Operating Lease Certificates (available to private and public companies) (6.6.3)	It is unlikely that any parts of the Amtrak system would be financed under an operating lease, given the current "public" structure, ownership and operation of the system. Low potential.
Finance or Capital Leasing (private and public companies) (6.6.4)	Amtrak and the State of Virginia have the authority to enter into long-term financing mechanisms (including capital leases). However, in some cases, if the financing mechanism results in a long-term obligation to a state or federal agency, the financing may require special approval and even a special Act (this was done for the multiple sets of high-speed Acela trains). On the other hand, VRE was able to acquire some second-hand, stainless-steel, double-deck commuter rail cars and refurbish them under its existing budget authority from the State of Virginia (through a capital lease structure). High potential.
Bonds with Public-Sector Backing (6.6.5)	The State of Virginia already makes use of capital project bonds for capital costs of transit and rail improvements (passenger and freight), as described above.
Corporate Bonds (available for private entities) (6.6.6)	This form of financing is not likely for the Amtrak Services, as there are no private concessionaires operating the system, and Amtrak currently has limits on any corporate borrowing ability. Low potential.
Mezzanine Financing (available to both private and public companies/authorities) (6.6.7)	This could be used by construction contractors at new stations to finance their outlay between compensation periods from local authorities / Amtrak. Medium potential.
Short-Term Corporate Line of Credit Financing (6.6.8)	Contractors to Amtrak do make use of corporate line-of-credit financing. The financing is usually secured by the contract with Amtrak. Amtrak may also be able to use short-term credit lines to shore up its balance sheet when revenue and expenditures are lumpy. Such sources provide short-term funding only when long-term funding is already secure. Low potential.
Sale of Stock (Ownership Stake) (6.6.9)	We do not see this as being applicable so long as Amtrak remains a not-for-profit corporation owned entirely by the government. No potential.
Tax/Investment Credits (6.6.10)	Sale of tax loss carry-forwards have been used by Amtrak to finance equipment in the past and could possibly be used for purchase of additional equipment going forward. Medium potential.



Source: 2013 Virginia Statewide Rail Plan, Figure 3-16, page 3-27.

Figure E-3. VRE ridership (FY1993-FY2012).

and Fredericksburg. Together, these services operate 30 trains over 90 route miles with 18 stations, carrying an average of 19,000 passengers daily. Trains are operated over the track of freight railroads (CSX for Fredericksburg Line, Norfolk Southern for Manassas Line). From 1992 to 2010, VRE was operated under contract by Amtrak.[29] Services are currently operated by Keolis Rail Services America (a private company owned partly by SNCF) under a five-year contract (2011–2016).

Ridership on the system has grown more than three-fold since 1993 (see Figure E-3). The existing system is operating at full capacity, including parking and midday train storage at the northern terminus. The 2013 Virginia Statewide Rail Plan identified capacity as a major concern, as VRE ridership is predicted to grow between 63% to 85% by 2025.[30]

To address congestion issues on both the north-south I-95 (Fredericksburg Line) and east-west I-66 (Manassas Line) corridors and provide alternative/enhanced services to travelers, the state is planning a two-phase program of investments to improve and expand VRE commuter operations, as follows.

- Phase I: Extending the north-south Fredericksburg line to a new greenfield station in Spotsylvania. This involves designing and building a 2.6-mile third-track project adjacent to the CSX mainline in Spotsylvania County between Crossroads and Hamilton. The project will enable operation of additional daily VRE Fredericksburg Line trains that originate at the VRE Crossroads yard. The VRE Spotsylvania County station enabled by this project is expected to increase VRE ridership by 2,000 daily trips by 2015 and 3,000 trips by 2025.[31]
- Phase II: Extending the east-west Manassas Line to Haymarket, with additional stops in Sudley Manor and Gainesville. This will involve constructing new stations and expanding rail

[29] 2013 Virginia Statewide Rail Plan, November 2013. Page 3-25.
[30] 2013 Virginia Statewide Rail Plan, November 2013. Page 3-25.
[31] 2013 Virginia Statewide Rail Plan, November 2013.

Source: 2013 Rail Resource Allocation Plan, page 39.
http://www.drpt.virginia.gov/activities/files/Final%20RAP%202013.pdf

Figure E-4. VRE existing commuter rail lines and proposed improvements.

infrastructure, station access and parking amenities, constructing train storage and maintenance facilities, and increasing rolling stock.[32]

These extensions are illustrated in Figure E-4.

Funding Requirements

The estimated capital costs of Phase I (extension of Fredericksburg line to Spotsylvania) are $32.5 million. Work is underway and fully funded. Funding is coming from the following sources:[33]

- $12.4 million (38%) in federal funding from FTA Urbanized Area grants (Section 5307), which provide up to 80% federal funding for planning, engineering design, evaluation of transit projects, and capital investments in fixed assets and rolling stock.
- $13.9 million (43%) from the state Rail Enhancement Fund (REF) grant program. As noted above, the primary source of revenue for the REF is receipt of 3 cents from the vehicle rental tax (currently 10 cents), which generates approximately $27 million annually. The REF also receives some funds from rail bond revenues.
- $6.2 million (19%) from other public and private matching funds, including from FTA, state transit capital, local gas tax revenues, REF, and CSX (CSX will benefit in the crossovers that they are participating in funding with REF).

[32] Virginia Rail Resource Allocation Plan: Complement to the Virginia Statewide Rail Plan. November 2013. Page 39.
[33] Six Year Implementation Plan, Page 69. Line items under "VRA Third Track Spotsylvania Extension."

Table E-5. Annual expenses for Virginia Railway Express (FY2007 to FY2012).

Revenue Source	FY2012		FY2011		FY2010		FY2009		FY2008		FY2007		6-Year Summary	
	Revenue ($)	% of Total	Revenue ($)	% of Total	Revenue ($)	% of Total	Revenue ($)	% of Total	Revenue ($)	% of Total	Revenue ($)	% of Total	Revenue ($)	% of Total
Operating Revenue (Fares)	$34,721,591	37.48%	$32,368,123	25.10%	$30,013,730	29.50%	$25,909,794	26.30%	$21,821,334	23.00%	$19,892,119	26.50%	$164,726,691	27.83%
Non-operating Revenues (Subsidy)														
VA DRPT	$12,711,602	13.72%	$12,806,509	9.90%	$13,153,781	12.90%	$13,482,816	13.70%	$10,795,443	11.40%	$12,269,884	16.30%	$75,220,035	12.71%
Federal	$17,181,121	18.54%	$16,157,284	12.50%	$14,525,795	14.30%	$12,784,123	13.00%	$12,522,868	13.20%	$12,741,069	17.00%	$85,912,260	14.52%
Local	$15,943,917	17.21%	$16,070,307	12.50%	$16,376,968	16.10%	$17,275,500	17.50%	$13,379,155	14.10%	$8,802,762	11.70%	$87,848,609	14.84%
Subtotal	*$45,836,640*	*49.47%*	*$45,034,100*	*35.00%*	*$44,056,544*	*43.40%*	*$43,542,439*	*44.10%*	*$36,697,466*	*38.60%*	*$33,813,715*	*45.00%*	*$248,980,904*	*42.07%*
Capital Grants and Assistance														
VA DRPT	$2,027,872	2.19%	$7,506,606	5.80%	$10,939,490	10.80%	$12,228,446	12 .4%	$14,959,850	15.80%	$9,455,655	12.60%	$57,117,919	9.65%
Federal	$9,997,070	10.79%	$43,444,643	33.70%	$15,839,667	15.60%	$14,702,198	14.90%	$19,218,547	20.20%	$10,762,936	14.30%	$113,965,061	19.26%
Local	$46,924	0.05%	$406,331	0.30%	$680,631	0.70%	$1,903,284	1.90%	$925,338	1.00%	$0	0.00%	$3,962,508	0.67%
Subtotal	*$12,071,866*	*13.03%*	*$51,357,580*	*39.90%*	*$27,459,788*	*27.00%*	*$28,833,928*	*29.20%*	*$35,103,735*	*37.00%*	*$20,218,591*	*26.90%*	*$175,045,488*	*29.58%*
Interest Income	$17,974		$15,059		$89,643		$406,855		$1,334,850		$1,220,780		$3,085,161	
Total Revenues	$92,648,071	100.00%	$128,774,862	100.00%	$101,619,705	100.00%	$98,693,016	100.00%	$94,957,385	100.00%	$75,145,205	100.00%	$591,838,244	100.0%
Combined VA DRPT Revenues	$14,739,474	15.91%	$20,313,115	15.80%	$24,093,271	23.70%	$25,711,262	26.10%	$25,755,293	27.10%	$21,725,539	28.90%	$132,337,954	22.36%

(Source: VRE Annual Financial Statements)

Source: Virginia Statewide Rail Plan 2013, page 4-6.

The capital costs for Phase II (expanding service on Manassas Line) are estimated at $1,009.8 million and are currently unfunded.[34]

Anticipated Funding Model

Currently, VRE operations and capital projects are financed from a combination of federal, state, local grants and fare box revenues. It is anticipated that these will continue to be the primary sources for ongoing operations and future investments.

Total revenues in FY2012 were $92,648,071, of which: 37.5% was from operating revenues (farebox revenues), 49.5% from non-operating revenues (subsidies from state, federal and local sources), and 13% from capital grants and assistance (state, federal and local sources). These sources and figures are summarized in Table E-5 for FY2007–FY2012.

A more detailed breakdown of the key funding sources for VRE is presented below.

Federal Funding Sources

Federal funds for VRE are apportioned annually to DRPT from the Federal Transit Administration (FTA). VRE services are eligible under two FTA funding programs for transit capital projects:

- FTA Urbanized Area Grants (Section 5307), which provide up to 80% federal funding for planning, engineering design, evaluation of transit projects and capital investments in fixed assets and rolling stock.
- FTA Fixed Guideway Capital Investment Grants (Section 5309), which provide capital funding for any fixed guideway system that utilizes and occupies a separate right of way or rail line, for the exclusive use of mass transportation.

Federal operating subsidies are provided from the Surface Transportation Program (STP) and the Congestion Mitigation and Air Quality Improvement (CMAQ) Program.

[34] Virginia Rail Resource Allocation Plan, November 2013, Page 39.

State Funding Sources

- Rail Enhancement Fund (REF). As described.
- Commonwealth Mass Transit Trust Fund. This is a multi-source-funded transportation fund that provides funding to a range of transportation services, including commuter rail,[35] airports, ports and highways. It is capitalized primarily from gas tax and sales and use tax revenues.
- Transportation Capital Bond Fund (Project Bonds). As described.

Local Funding Sources

Some northern jurisdictions use local general funds to support VRE commuter operations, and some have gone as far as levying a 2% motor fuels tax to assist in the implementation and ongoing operations of VRE services.[36] However, local jurisdictions often have many competing priorities for funding and are increasingly looking for alternative financing vehicles for commuter rail operating and capital costs (e.g., PPP, value capture, etc.).

". . . New legislation [in place since July 1, 2013] enables the state to raise transportation funds for Planning Districts that meet population, transit ridership and other thresholds" [2013 Virginia Statewide Rail Plan, page 4-11].

Potential for Alternative Funding and Financing Mechanisms

Table E-6 illustrates the potential for alternative funding and financing mechanisms for addressing future funding gaps for new VRE services (e.g., Phase II onwards).

Case Study (Shared Rail Corridor): New Orleans Rail Gateway Program

Project Overview[37]

Transport infrastructure in the New Orleans area is constrained by local geographic features (including the Mississippi River and tributaries, lakes and bayous, and ultimately the ocean) as well as by man-made features designed to protect the city from flooding and control the flow and route of the Mississippi.

New Orleans is a large, busy and important rail hub. The New Orleans area is served by a number of rail lines connecting ports, railways, industrial areas and intermodal terminals. Rail lines from the east and west connect across the Huey P Long Bridge. It is home to six of the seven largest US railroads as well as a number of short line and terminal railroads. It is the fourth-largest US rail gateway (a place where rail freight is interchanged between railroads)[38] and one of the largest rail crossings of the Mississippi River[39] connecting eastern and western rail systems. See Figure E-5 for a visual depiction.

New Orleans is also home to the country's eighth-busiest port, serving not only river traffic but also international ocean shipping (it serves both bulk agriculture and minerals traffic as well as container and merchandise traffic).

The New Orleans Rail Gateway (NORG) is a rail corridor running through New Orleans connecting the US east and west rail networks across the Mississippi River. The corridor traverses

[35] The Mass Transit Trust Funds cannot be used for intercity passenger rail.
[36] Virginia Department of Rail and Public Transportation. "Funding Strategies for State Sponsored Intercity and High Speed Passenger Rail [SJR 63 (2010)]. Senate Document No. 14. 2010. Page 21.
[37] Information taken from combination of interview with DOTD staff and "New Orleans Rail Gateway Public Scoping Meeting Presentation, February 7 and 8, 2012" http://www.dotd.la.gov/administration/public_info/projects/norg/Public_Meeting_Materials/Scoping_Meeting_Presentation.pdf
[38] Other major east-west gateways are Chicago (#1), Kansas City (2), St. Louis (3) and Memphis (5).
[39] The other major cross-Mississippi River interchanges are in St. Louis and Memphis.

Table E-6. Potential application of alternative funding and financing mechanisms for expanded VRE services.

Service or Asset-Related Revenue (Funding) Mechanisms	Potential for VRE Services
Market Pricing to Maximize Fare Box Revenues (6.4.1)	VRE's fare structure is based on different fares for different geographic "zones" in the system, and offers riders discounts for multi-ride ticket packages (single-ride, 10-ride, five-day or monthly pass). One option for VRE to increase revenues (and ridership) might be to implement a variation in ticket prices based on time of day to reflect market pricing. Ticket prices could be slightly higher in heavily congested peak travel periods, and slightly lower in quieter periods. On average, some peak passengers may need to pay more, but would benefit from less crowded services and would have the option to pay less by changing their travel times. High potential.
Premium Services to Increase Service Revenues (6.4.2)	Commuter rail services in the US do not offer a premium rail service, though there are international examples (e.g. many UK commuter rail operators offer First Class service. The Dubai metro offers a "Gold Class"). The extent to which this could generate significant additional revenue is unclear. Medium potential.
On-board and In-Station Retail Concessions (6.4.3)	Given the construction of new commuter rail stations, there will likely be scope to generate revenues from in-station retail concessions. Commuter rail services do not typically offer on-board retail services, so this is unlikely to be a revenue-generating tool. Low potential.
Track Access Charges (6.4.4)	This is not a potential source of revenue, as VRE does not own track infrastructure. No potential.
Selling or Leasing Access to Railroad Rights of Way (6.4.5) (The operator and the owner may be different, which is often true of passenger operators. The benefits go to the owner.)	There may be potential to generate revenues from selling or leasing access to VRE-owned property around new station developments, though not along the railroad track (which is owned by freight railroads). Medium potential.
Commercial Property Development/Joint Development (6.4.6)	VRE will soon (2017) be opening a new station in Spotsylvania, with longer-term plans for three new stations on the Manassas Line. These new stations will provide opportunities for VRE to engage in commercial property development with the objective of obtaining some form of commercial revenues from the development (e.g., retail, office buildings, parking, etc.). Joint development between the land-owning public entity (state or local government) and a private developer to develop certain assets could also be an option. Such an approach takes a commercial mindset, political will and legislative ability to partner with the private sector, all of which appear to be in place in Virginia. Station development is one area where local agencies can benefit from being particularly active and involved in passenger rail funding; it typically improves station design and facilities, and also provides very visible economic development opportunities for their citizens. High potential.
Branding, Sponsorship, and Naming Rights (6.4.7)	Private sector companies could also be approached to pay for advertising and sponsorship at the new stations, even going as far as naming a station after a corporate sponsor (e.g., a mall). The extent of financing potential is significant, depending on the location and number of anticipated viewers of the branding (e.g., number of passengers who will pass through the station platform). Low-Medium potential.

(continued on next page)

Table E-6. (Continued).

Public Revenue (Funding) Mechanisms	Potential for VRE Services
Incremental Property Tax Revenues (for Tax Increment Financing) (6.5.1)	Tax Increment Financing could be used if properties around the new VRE station property development are expected to increase significantly in value, a prospect that in turn may depend on the level of commercial property development around the station. Under such an approach, as new funds are invested (e.g. new retail, new commuter train station), property values increase and so do property tax revenues. The incremental increases in property tax could be ring fenced and used to finance the capital costs of building the station. Most US states have TIF-enabling legislation, though this legislation typically requires testing of a "but for" requirement to establish a TIF district; this consists of proving that the area would not develop "but for" the creation of the TIF district. Whether or not this would be the case for the three new stations on the Manassas Line (Haymarket, Sudley Manor and Gainesville) would need to be studied. High potential.
Special Assessment District (SAD) Fees (6.5.2)	Special Assessment District fees could be applied to residents/businesses that will stand to benefit directly from the construction of a new commuter rail facility. This is a traditional method of financing local improvements whereby individuals in a special "district" pay a distinct levy, tax or fee for local infrastructure investments which will directly benefit them (and typically only them). Large sums of revenue can be generated from SADs, though their relative contribution to cover costs varies depending on the overall capex requirements for the project. SAD revenues have the benefit of being highly stable, as they are usually fixed at the time of the SAD formation, with fees collected upfront or annually. Establishing a SAD typically requires enabling state-level legislation, as well as a local SAD authorizing ordinance. High potential.
Impact Fees Charged to Property Developers (6.5.3)	In the case of the new VRE stations, charging impact fees to developers could work if there is already a market in place for property and retail development. Like other types of value capture, these fees are more suitable for rapidly growing jurisdictions with a high demand for property and increasing real estate values. Without such demand, developers need incentives (not disincentives such as additional fees) to develop property. High potential.
Station Parking Charges (6.5.4)	Station parking charges would certainly contribute to supporting the cost of station construction and operation for new VRE stations. High potential.
Road Tolling/Congestion Charging (6.5.5)	Road tolls and road congestion charging are not likely to be used to support VRE investment or operating costs, but they could increase demand for VRE service and increase revenues that could be used to help fund VRE. This could however be politically challenging. High potential but unlikely.
Heavy Goods Vehicle (Truck) Charges (6.5.6)	Not applicable. No potential.
Gas Tax (6.5.7)	Some northern jurisdictions already levy a 2% motor fuels tax to assist in the implementation and ongoing operations of VRE services. This could potentially be extended to new jurisdictions that will be served by VRE in future, as a means to generate revenues for investment and operations. High potential.

Table E-6. (Continued).

Public Revenue (Funding) Mechanisms	Potential for VRE Services
Car Registration Plate Auction (6.5.8)	We are not aware of any plans for such an auction, though this could be a significant potential source of revenue that could be used for supporting VRE. High potential.
Motor Vehicle Registration Fees (6.5.9)	We are not aware of any plans for such fees to be implemented. The state already taxes car users through a 3-cent portion of the vehicle rental tax (currently 10 cents). High potential but unlikely.
Vehicle Mileage-Based User Fee (6.5.10)	A vehicle mileage-based user fee could raise significant sums – a 1 cent per mile user fee would have raised about $800 million in 2012. The state has already approved many toll roads and is practicing congestion pricing in the Washington area using an EZPass system. A vehicle mileage-based user fee system is possible but politically difficult. High potential but unlikely.
Payroll Taxes Used for Transport (6.5.11)	Not likely to be applicable for VRE's new stations. Low potential.
Sales Tax (6.5.12)	It is unlikely that a statewide sales tax could be used for VRE services that provide benefits to residents in northern jurisdictions only. Ongoing (and potentially increased) use by northern jurisdictions of the 2% motor fuels tax to assist in the implementation and ongoing operations of VRE appears like a more feasible (and politically acceptable) option. High potential but unlikely.
Carbon Tax or Credits (Cap-and-Trade) (6.5.13)	Cap-and-trade legislation has been proposed in Virginia in the past, though former bills have not passed and have been opposed by industry (including manufacturers and coal producers). We are not aware of any plans to establish a cap-and-trade system going forward. High potential.
Financing Mechanisms	**Potential for VRE Services**
Public-Private Partnerships (PPPs) (6.6.1)	PPPs are possible in Virginia and may provide a model for the implementation of VRE. High potential.
Equipment Trust Certificates (available to private companies) (6.6.2)	Private operators of the VRE services (currently Keolis) could potentially make use of equipment trust certificates, but this would not have an impact on the funding gap for VRE per se. Medium potential.
Operating Lease Certificates (available to private and public companies) (6.6.3)	The private operators of VRE services could potentially enter into operating leases with providers of rolling stock (e.g. Bombardier), though this would not directly affect the funding gap from the perspective of the state of Virginia/VRE. Medium potential.
Finance or Capital Leasing (private and public companies) (6.6.4)	This is not likely to be a feasible option for VRE capital investments, in part because access to such finance is largely based on the creditworthiness of the lessee, and VRE requires both capital and operating subsidies. Capital leases must be specifically approved by the Virginia Treasurer and may require specific authorization if large enough. Low potential.
Bonds with Public-Sector Backing (6.6.5)	The State of Virginia already makes use of capital project bonds for capital costs of transit and rail improvements (passenger and freight), as described above. High potential.
Corporate Bonds (available for private entities) (6.6.6)	This form of financing could possibly be used by private operators of the system, though would likely not be used by the public owners (VRE) of the system. Medium potential.

(continued on next page)

Table E-6. (Continued).

Financing Mechanisms	Potential for VRE Services
Mezzanine Financing (available to both private and public companies/authorities) (6.6.7)	This could be used by construction contractors at new stations to finance their outlay between compensation periods from local authorities / State of Virginia. Medium potential.
Short-Term Corporate Line of Credit Financing (6.6.8)	Contractors to VRE do make use of corporate lines-of-credit financing. The financing is usually secured by the contract with VRE or the State of Virginia. VRE may also be able to use short-term credit lines to shore up its balance sheet when revenue and expenditures are lumpy. Such sources provide short-term funding only when long-term funding is already secure. Medium potential.
Sale of Stock (Ownership Stake) (6.6.9)	We do not see this as being applicable so long as VRE remains under ownership by the government. Low potential.
Tax/Investment Credits (6.6.10)	Not applicable. No potential.

Source: New Orleans Rail Gateway Program, "The Right Track: Official Program Newsletter," June 2012, Vol. 1, No. 1. http://www.dotd.la.gov/administration/public_info/projects/norg/newsletters/Volume%201,%20Number%201%20-%20June%202012.pdf

Figure E-5. Map of New Orleans Rail Gateway program area.

Jefferson and Orleans Parishes from the West Bank of the Mississippi River near the St. Charles/Jefferson Parish line and ending in New Orleans East at Industrial Parkway near the Michoud Assembly Center. The primary current interchange line is shown in Figure E-6.

The gateway handles approximately 35 freight trains per day (about 1.7 million freight cars in 2011). The current volume of rail freight traffic routinely causes congestion and higher costs for rail carriers and impacts local community road users. Freight demand is projected to grow by 48% by 2038 (from about 13.1 million tons in 2010 to 19.5 million tons in 2038).[40] Road traffic is also projected to increase substantially. So, both road and rail capacity must be expanded for this growth to take place. There are also three Amtrak trains a day through the gateway.

Improvements to the rail infrastructure are needed to address the following:

- Current freight demand routinely impacts both rail and road traffic, and NORG would not be able to accommodate future freight demand.
- Antiquated rail control systems and interlockings, and local speed regulations lead to slow travel times through the Gateway (trains passing through the NORG are limited to 20 mph for both physical and regulatory reasons).
- Some of the busiest rail lines go through residential and commercial areas at grade so that stopped trains block local traffic, including ambulances, school buses and normal vehicular traffic.
- Flood gates limit emergency responsiveness (flood gates at various locations are closed up to 24 hours prior to and following storm events, limiting railroads' ability to transport evacuees and emergency supplies).
- Almonaster Bridge, owned by the Port of New Orleans Commission, is over 80 years old, subject to frequent unscheduled maintenance and is a source of delay.

A series of studies are underway to identify rail and roadway improvement projects to upgrade the NORG and other infrastructure in Jefferson and Orleans Parish to increase regional competitiveness and enhance economic growth. Similar studies on improvements in the NORG have been studied multiple times over the past 35 years, though no effort has progressed as far as the current series of studies (environmental assessment stage). The program of study was expected to take three years to complete (2011–2014), though as a result of some delay, the studies are now expected in mid-2015. A number of alternative routes are being studied. Figure E-6 shows the major route alternatives and the location of major bridges in the impacted area.

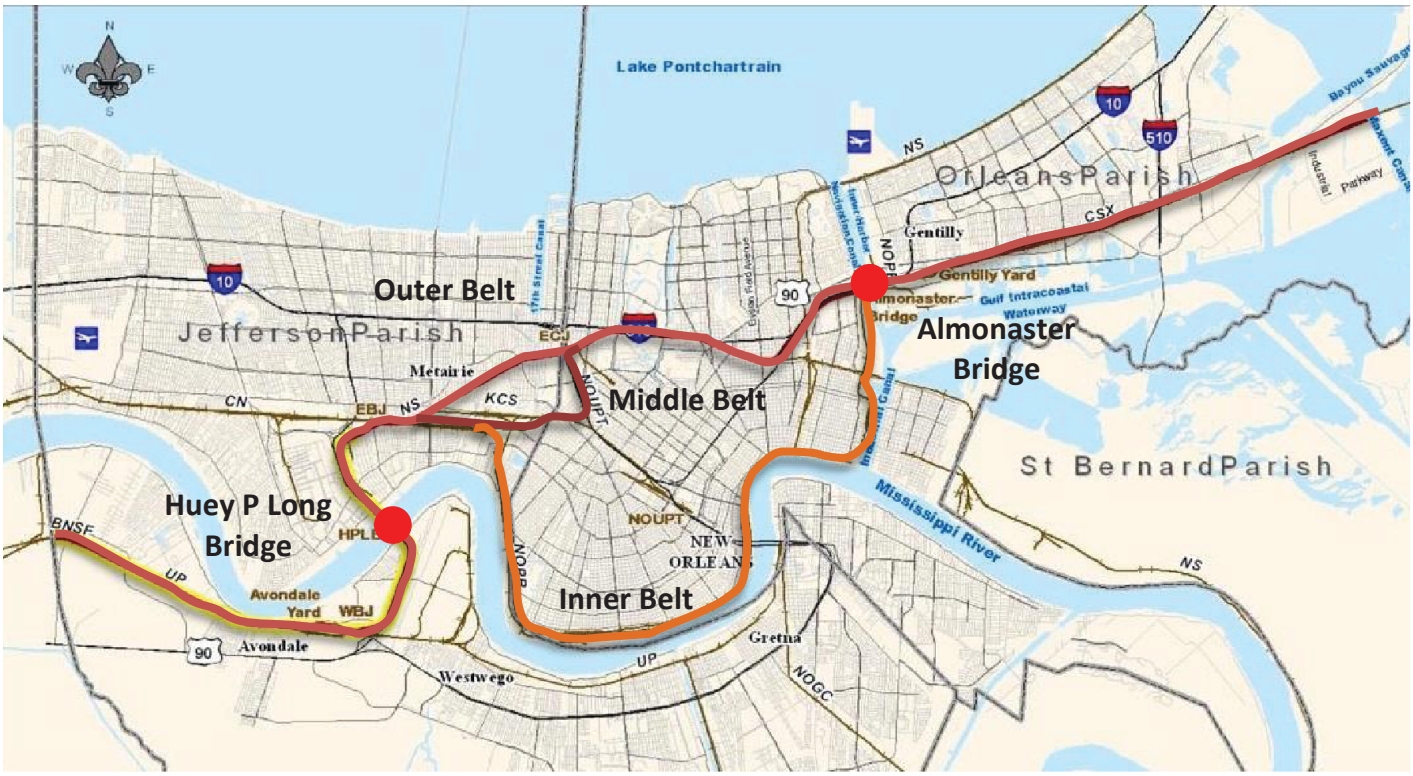
Potential Investments include

- Improve alternative routes through the cities to 1) increase separation of rail and road traffic, 2) increase permitted train speeds, 3) provide additional spaces for staging train movements through the corridor and across the Huey P Long Bridge.
- Provide improved train control systems and automate interlocking systems to reduce delays to trains.
- Replacement or overhaul of the Almonaster road/rail Bridge (owned by the Port Authority Commission and carrying both a two-lane road and a double-track CSX rail line) over the industrial canal at the east end of the rail corridor (shown as a large dot in Figure E-6).

The use of the New Orleans Public Belt rail line (shown as "Inner Belt" in Figure E-6) has been eliminated for various reasons (including difficult rail and highway traffic impacts, flood protection issues, environmental and other concerns). The major route options under consideration in current studies include

- Improvement of the middle-belt line and constructing a connection in the northwest quadrant. This option requires acquiring new land along the route and is constrained by the sharp

[40] http://fsjna.org/wp-content/uploads/2014/01/S38_New-Orleans-Rail-Gateway-Program_LTC2013.pdf



Source: NORG Program, "The Right Track: Official Program Newsletter," June 2012, Vol. 1, No. 1. http://www.dotd.la.gov/administration/public_info/projects/norg/newsletters/Volume%201,%20Number%201%20-%20June%202012.pdf

Figure E-6. Map of NORG alternative routes.

curve required for the connection, which would limit train speeds to 20 mph or less. This alternative would involve trackage owned by CSX and the New Orleans Public Belt Railway.

- Reconstruction of the "Outer Belt," the current major connection, to separate it from neighborhood road traffic and increase train speeds. This option, which involves raising the rail line and sinking streets, might create more physical barriers in a politically active upscale community. This alternative involves trackage owned by CSX and Norfolk Southern railroads.
- Improve rail signaling and control systems to integrate train management, reduce trains waiting for clearance to proceed and reduce the time that trains are stopped in the urban area. This improvement involves facilities owned and operated by nearly all rail systems.

Replacement of the Almonaster Bridge was an urgent local priority and has moved ahead, independent of the NORG project. While many options for replacing the bridge with a different design (to improve horizontal clearances) were considered, the Commission decided to replace the Bascule design bridge in kind (similar to the one shown in Figure E-7). The cost for alternative designs was considered too high but Bascule bridge designs need to be lowered when there are no high winds. The Almonaster Bridge was lowered during Hurricane Katrina and was damaged by flood waters. Expected to cost about $160 million, financing for the replacement of this bridge was arranged by the Port Authority Commission, using some highway funds and with some contribution by CSX.

The program of studies for the NORG project is funded in partnership between public and private entities. Partners in the program are the Federal Railroad Administration (FRA) and the Louisiana Department of Transportation and Development (DOTD), in coordination with the New Orleans Regional Planning Commission (RPC), and the railroads operating in the New Orleans metropolitan area[41] through the Association of American Railroads (AAR).

Figure E-7. Bascule design bridge.

Project Issues

In addition to political and social issues related to the route alternatives, the project is also dealing with a proposal to increase passenger rail service dramatically—from the current three passenger trains per day to as many as 64—a tremendous increase (some would be "high-speed" trains, some conventional and commuter services to Baton Rouge, the state capital, and maybe other places—they would all travel through the NORG corridor to a passenger station in the center of New Orleans). While there are currently no firm plans for such dramatic increases in rail passenger services, the FRA is asking NORG to plan for the higher figure over the next 20 years.

This level of rail passenger services will require substantial increases in rail capacity, more than is available in any alternative currently being considered. If it is necessary to provide capacity to more than triple the number of train movements, current estimates are that project costs could more than double. Political issues are likely to play a significant role in the NORG project for several reasons. First, the Inner Belt route (the current major route for east-west through traffic) runs through a higher-income neighborhood while the middle belt runs through a lower-income neighborhood and an industrial area. Several local and state politicians live in the higher-income neighborhood, so the route selection is likely to draw more than the usual political attention.

Another political issue will be the availability of state funding. The state's limited resources are still stretched by recovery from the effects of the hurricane. In addition, the state legislature has been more than passively anti-rail, passing legislation that required any state-match in federal programs be paid by the railroads, not by the state. This prohibition on the use of state funds for freight rail projects persists in current legislation. There is also political opposition to high-speed rail projects that have been mooted in the area, including the FRA's forecast of large increases in passenger rail service. Many politicians think the state has many other issues to address (e.g., education, health, highways) before they can consider rail passenger services.

Finally, while the freight railroads have indicated that they are ready to participate in the project, each project would have to pass internal rate-of-return hurdle tests and must compete with other railroad projects. The participating freight railroads have contributed to the cost of the current feasibility studies but say that participation in actual projects will be related to the benefits they perceive to be generated by the project. The freight railroads do have a lot to gain from reduced operating costs, improved reliability and faster movement through the gateway, but they also recognize that many of the benefits from these projects will accrue to the public in reduced congestion, lower noise and environmental impacts, and improved public safety.

[41] Railroads participating in the project are: Northern Santa Fe Railway (BNSF), CN, CSX, Kansas City Southern Railway (KCS), Norfolk Southern Railroad (NS), Union Pacific (UP), Amtrak, and the terminal switching railroad—owned by the City of New Orleans—the New Orleans Public Belt Railroad (NOPB).

Anticipated Funding Requirements

The NORG projects (excluding replacement of Almonaster Bridge) are expected to cost about $750 million and will involve rail, highway, flood protection and community-related elements. Current estimates are that there is less than 5% difference in total project costs between the two primary alternatives. But if the project has to cater to the projected 20-year growth in passenger traffic, both alternatives and additional investment may be needed.

Since route alternatives have not been determined yet, funding proportions by participants have not been determined. It is expected that the railroads will participate in proportion to the benefits they receive, but accounting methods for determining those benefits have not been agreed. Currently, of the $750 million (excluding investment to meet the high passenger projections), it is estimated that the railroads will provide about $115 million (15%) of the overall funding, the Parishes are expected to provide about $115 million (15%) with the remaining funding coming from other sources.

Considering the likely categories of investment needed to increase capacity, reduce rail/highway interfaces and cater to the physical characteristics (flood control) of New Orleans, it is likely that the investments will include spending for (in order of likely investment size):

1. Changes to highways and streets, including overpasses and underpasses, and perhaps elevation or depression of main roads and for flood control and environmental facilities;
2. Land acquisition for additional trackage, and land related to cuts and fills needed to accomplish vertical separation of rail and road networks;
3. New rail infrastructure and facilities;
4. Signaling and train control equipment, including electrically operated interlockings, wayside sensors and related facilities;
5. Office or headquarters equipment and computers to manage rail routes and control interlockings, and provide supervisory capabilities;
6. Signal and train control equipment on rolling stock.

In this list, Items 1, 2 and 3 can be related to a specific location; train signaling investments (Item 4) can also be location related but must operate as a part of a system, so this investment can be staged but would cover the entire route. It is likely that the freight railroads will want to control investments for Items 4, 5 and 6. Government bodies would likely be responsible for Items 1 and 2 and the cost of investments in Item 3 (new tracks) might be shared.

Anticipated Funding Model

Since a package of investments to achieve the desired objectives for NORG has not been developed, the funding model to be used has not been determined. It is anticipated that the freight railroads will pay for some improvements, the parishes for some, and the rest will be derived from federal and as yet undetermined sources. State participation seems problematic for rail facilities but may be politically acceptable for highway, environmental, flood protection and perhaps land acquisition investments. It is anticipated that the investments will be divided into packages of $10 million to $50 million each and financing for those packages will be determined as they are agreed.

There are currently no plans to form an authority to acquire and revamp rail facilities in the New Orleans area, as was done for the Alameda Corridor in California, though these could evolve over time.

Potential for Alternative Funding and Financing Mechanisms

Table E-7 shows how the funding and financing mechanisms could apply to support funding of the New Orleans Railroad Gateway project.

Table E-7. Potential application of alternative funding and financing mechanisms for NORG.

Service or Asset-Related Revenue (Funding) Mechanisms	Potential for NORG
Market Pricing to Maximize Fare Box Revenues (6.4.1)	Freight railroads already use market pricing for the most part. Rail prices are typically quoted across railroads and interchanges. Railroads have longstanding and often elaborate interchange and cost agreements where detailed cost accounting provides the basis for charges between each other for interchange services, including switching. Market pricing for interchange movements (e.g., higher prices for more urgent or valuable train movements or penalties for delayed movements) would require changes in these agreements. Such changes might be facilitated by formation of a NORG authority or enterprise unit (e.g., by forming an Alameda Corridor-like authority or perhaps expanding the role of the New Orleans Public Belt Railway) to operate the gateway on a fee basis. In this type of structure, a new entity (say, the NORG Authority) would acquire all the trackage necessary to implement the proposed investment program, then sell bonds, make improvements and set up service contracts with each railway. At the present time, this alternative appears unlikely, in part because the authority or enterprise would have to be capitalized in some way to acquire the private tracks of many different rail companies. It is difficult for the private railroads to meet to reach agreement to set up a jointly owned private enterprise and little reason to do so absent a commitment from government for substantial contributions in the way of land and road, flood control and other investments that contribute to social benefits. Potential unlikely.
Premium Services to Increase Service Revenues (6.4.2)	For freight, this is simply an expansion of market-based pricing – charging higher prices for special service (e.g., expedited service for container trains) or for charging different prices for certain types of trains or commodities (e.g., for unit coal trains, unit oil trains, or unit grain trains). This is discussed above in market pricing. Potential unlikely.
On-board and In-Station Retail Concessions (6.4.3)	The freight equivalent is selling additional services, usually through specialized facilities. This source of revenue is already available to private freight services. Private railroads can set up specialized terminals for containers and bulk commodities. It is possible that the formation of an overall NORG authority or jointly owned private enterprise could expand the opportunity to set up new facilities in what are now NOPB lines and Port of New Orleans land. Such capabilities could provide some incentive for the private railroads to form such authorities/enterprises. Public participation may be politically difficult. Medium potential.
Track Access Charges (6.4.4)	Depending on how the improvements are made, they will probably be paid for through some sort of track-access charging system, possibly similar to Alameda. Railroads typically charge an access-type fee for the use of key facilities. If a NORG Authority or Enterprise were established, it would likely base its charges on track-access fees. With the notes about the potential for market pricing above (e.g., for expedited service), and a project that provided sufficient capacity to be able to offer such expedited services, pricing could be both cost based and competitive. High potential.

(continued on next page)

Table E-7. (Continued).

Service or Asset-Related Revenue (Funding) Mechanisms	Potential for NORG
Selling or Leasing Access to Railroad Rights of Way (6.4.5) (The operator and the owner may be different, which is often true of passenger operators. The benefits go to the owner.)	See note about revenue from selling additional services above. Most freight railroads currently sell easements to their right of way for electrical power, fiber optical lines and other uses. Most of the lines in the NORG have associated with them either public-use roads that share the right of way, or access roads for the use of authorized vehicles. Recent work on the Huey P Long Bridge expanded the combined rail and highway bridge to three highway lanes each way. The bridge has two railway lines. High potential.
Commercial Property Development/Joint Development (6.4.6)	Railroads are commercial entities and already rent/sell and develop property they own. NPBR does the same thing. It might be argued that formation of a New Orleans Railway Authority or joint enterprise might permit greater development of land resources; this is not likely unless NOPBR lines and port-side facilities were included, and that this inclusion permitted more intensive development. A final consideration is that the rail lines in question go through high-value urban neighborhoods, which are already developed, so little additional money is likely to be raised from this source. Low potential.
Branding, Sponsorship, and Naming Rights (6.4.7)	This source appears to have minimal value for NORG rail lines, even if an authority or joint private enterprise were formed. Low potential.
Public Revenue (Funding) Mechanisms	Potential for NORG
Incremental Property Tax Revenues (for Tax Increment Financing) (6.5.1)	Railroad property is already subject to property taxes; additional tax revenue may drive rail traffic to other gateways. Other private property taxes could be increased in the parishes to fund public transport investments. By the state's constitution, the State of Louisiana sets the property valuation rate for the state; local parishes approve the "mill-rate" or the tax rate based on the valuation through a ballot initiative. Few parishes in Louisiana have approved such initiatives over the past 15 years (two out of six attempts). Low potential.
Special Assessment District (SAD) Fees (6.5.2)	Formation of an authority or private enterprise would allow the authority to sell bonds or raise fees. The state could help in the formation of the enterprise or authority by the formation of a special assessment district. Medium potential.
Impact Fees Charged to Property Developers (6.5.3)	Not under consideration. Low potential.
Station Parking Charges (6.5.4)	Generally not applicable for NORG. Railroads and rail customers are already charged extra for delays and storing cars in key facilities. Low potential.
Road Tolling/Congestion Charging (6.5.5)	Road tolls and road congestion charging could be used to support shared facilities. High potential.
Heavy Goods Vehicle (Truck) Charges (6.5.6)	For facilities over which trucks operate, a special heavy goods vehicle charge could help increase available funds. High potential.

Table E-7. (Continued).

Public Revenue (Funding) Mechanisms	Potential for NORG
Gas Tax (6.5.7)	Gas taxes could be used to support both road and rail investments but are politically difficult to increase. The NORG is a local investment. Increasing state or federal gas taxes to support local investment efforts, especially those oriented to improving rail freight traffic flows, even if there are large and even overwhelming local public benefits, is problematic. High potential but unlikely.
Car Registration Plate Auction (6.5.8)	Like increases in gas taxes, increases in registration fees could be used to support both road and rail infrastructure investments. It is politically difficult to increase taxes, car ownership costs and other mechanisms to support local infrastructure investments. Medium potential but unlikely.
Motor Vehicle Registration Fees (6.5.9)	See comments above. Difficult to pass for a locally oriented investment. Medium potential but unlikely.
Vehicle Mileage-Based User Fee (6.5.10)	Vehicle mileage-based user fees could be used to support these and other rail and transit-related projects. A one cent per vehicle mile user fee in Louisiana would raise about $465 million in revenue that could be used to finance not only the NORG project but also transit and road maintenance projects throughout the state. Implementation of such user fees or tax structures is politically difficult. High potential but unlikely.
Payroll Taxes Used for Transport (6.5.11)	Local payroll taxes could be used to raise general funds for transport projects. These have not been considered for the NORG project. Low potential and unlikely.
Sales Tax (6.5.12)	Similar to the other tax-related issues. Not likely to be applicable for a local project that improves rail performance, even if there are large road transport and other social benefits. Low potential and unlikely.
Carbon Tax or Credits (Cap-and-Trade) (6.5.13)	Not applicable in New Orleans or Louisiana and not appropriate for reasons given above. Low potential and unlikely.
Financing Mechanisms	**Potential for NORG**
Public-Private Partnerships (PPPs) (6.6.1)	The NORG projects will be some type of public-private partnership. The private rail systems have already committed to fund their share of the investments required. It is expected that the public share of necessary investments will be funded by conventional sources. The final form of the package of improvements and routes will have to be approved before the parties will be able to investigate how these investments are to be structured. High potential.
Equipment Trust Certificates (available to private companies) (6.6.2)	Private railroads may use this mechanism to finance equipment that operates over the NORG lines. Railway rolling stock is not really a significant part of the NORG effort. Low potential.
Operating Lease Certificates (available to private and public companies) (6.6.3)	The particular form of financing the investments needed for the rail improvements to NORG will depend on the route selected and the mechanism developed to structure the investment program. It is likely that some equipment (e.g., construction and maintenance equipment) will be leased for the work. Some facilities could be constructed on an operating lease basis but it would depend on who owned the facilities and the structure of how they were controlled. Medium potential.

(continued on next page)

Table E-7. (Continued).

Financing Mechanisms	Potential for NORG
Finance or Capital Leasing (private and public companies) (6.6.4)	Capital or finance leases might be used, as with operating leases, depending on how the project is structured. Some elements of the project could be paid for by private railroads and leased to a public entity (e.g., an authority or other private enterprise) for joint operation. This could be the best way to make improvements that will be financed in part by public grants but where the underlying property is privately owned. Medium potential.
Bonds with Public-Sector Backing (6.6.5)	This is a likely source of investment funds for the project. The primary issue will be what authority or public agency is authorized to sell the bonds. High potential.
Corporate Bonds (available for private entities) (6.6.6)	If the NORG project is structured as a private enterprise that could be capitalized by land and off-take contracts with the private railroads and perhaps some revenue stream commitment from state or local governments, the private enterprise could sell corporate bonds to finance necessary investments. High potential if project structured as private enterprise.
Mezzanine Financing (available to both private and public companies/authorities) (6.6.7)	This may well be used by construction contractors to finance their outlay and by any closely owned joint private enterprise set up to facilitate the construction of the set of investments needed to implement the NORG gateway improvements. Medium potential.
Short-Term Corporate Line of Credit Financing (6.6.8)	It is likely that contractors will use short-term line-of-credit type financing to mobilize construction activities for the projects that will become part of the NORG improvement program. Low Potential.
Sale of Stock (Ownership Stake) (6.6.9)	This could be the source of funding for a joint private enterprise or public/private authority where land transfers (either via title or via leases) would be compensated by interest in the joint private enterprise. The joint private enterprise would use these assets to raise capital through the issuance of corporate bonds. Medium potential.
Tax/Investment Credits (6.6.10)	Tax credits and investment tax credits would be used to reduce the cost of investments by the private railroads. They would not be useful to public agencies that do not pay taxes. Potential depends on structure.

Case Study (Shared Rail Corridor): CREATE Program

Project Overview

Chicago is the nation's primary rail hub—more rail traffic is interchanged between US railroads in Chicago than at any other location. Some 40,000 rail freight cars go through the region every day. It has also been and remains an important rail passenger center with many commuter, suburban intercity and long-distance trains providing more than 70 million passenger trips annually.

The railroads and the city have grown up together over the past 150 years; its 3,000 miles of tracks are woven into the fabric of the region. In recent years (since about 1990) increased rail traffic, more container trains, more commuter trains and increasing population density have combined to form near gridlock during rush hours. Freight trains wait for commuter trains to complete their trips, blocking streets and causing congestion. Projections of future freight and passenger rail services have shown that something has to be done to prevent regional gridlock.

Figure E-8. CREATE Projects.

Private railroads, commuter authorities, and state and regional transportation authorities came together starting in the late 1990s to seek solutions to common problems. The Chicago Regional Environmental and Transportation Efficiency (CREATE) Program resulted from this effort. After extensive analysis, paid for jointly, a complex program under the CREATE umbrella was agreed.

CREATE is a unique program formed by all of Chicago's transportation stakeholders. CREATE's stakeholders include the eight private freight railroads serving the region,[42] Amtrak and METRA (the commuter rail carrier), all of which are represented by the AAR. They also include about 500 local community governments, represented by the Illinois Department of Transportation, and the City of Chicago, represented by CDOT. Figure E-8 provides information on CREATE projects.

Working together, a program to enhance road and rail transportation performance was developed. The program includes the creation of low-interference rail corridors, changes in train routings, clearing a corridor for passenger trains, eliminating rail/rail and rail/road crossing bottlenecks—more than 70 projects in all—and a chronology or order for completing the

[42] BRC, BNSF, CP, CN, CSX, IHB, NS, UP.

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projects. At the same time, the railroads formed a joint office, the Chicago Transportation Coordination Office (CTCO), to jointly manage and coordinate train movements and to analyze and respond to changes as the projects were implemented. The projects that make up the overall program were optimized in rail and highway traffic simulation models to ensure that each project and proposal contributed to the creation of capacity and improvement in train and vehicle flows, reduced congestion and improved air quality. Once the set of projects had been agreed, costs and benefits were estimated: capital costs were estimated at $1.534 billion. Based on the distribution of benefits received and the types of projects, the railroads agreed to invest $232 million.

An important feature of the program is the role of IDOT/FHWA in developing an enhanced method to complete necessary environmental studies and expedite approvals. The Systematic Project Expediting Environmental Decision Making strategy (SPEED Strategy) is a way to handle the environmental impact analyses for all projects in an integrated way, allowing common assumptions about changes in emissions, traffic levels and other environmental impacts for the whole program. This approach reduced a common problem for individual project evaluations—segmenting the approval process does not recognize the combined effects of all projects. The SPEED Strategy allowed these combined benefits to be identified, computed and allocated to each project.

This set of projects, projected costs and expected benefits was codified in a Feasibility Report, which also included a set of agreements and undertakings that defined how the projects would be implemented and managed as well as ownership and maintenance responsibility for the investments when completed. The agreements outlined a stringent mechanism for changes in the project list, and defined a governance structure for the program. This structure, which is defined in joint statements of understanding and related legal agreements, includes:

- The CREATE project governance structure is headed by a three-member Stakeholder Committee whose chairman is appointed by the railroads, and other members include the Commissioner of CDOT and the Secretary of IDOT. All decisions by the Stakeholder Committee must be unanimous. All projects fall to one of three CREATE program Managers—one for railroad components; one for rail passenger components (e.g., METRA and Amtrak); the third for public components (e.g., rail/road grade separations, rail/road grade crossings). It is the responsibility of the Program Manager for changes and refinements in scope, sequence and other changes.
- The Chicago Transportation Coordination Office is responsible for reviewing and updating rail operating assumptions as the projects are implemented and for coordinating train operations in the region. They also advise on the impacts of changes in scope and any changes in the project structure.
- A Project Office, retained by the AAR and responsible to the Stakeholder Committee, approves all final designs and provides accounting, engineering and schedule management skills to the Program Managers.
- A Management Committee, composed of 11 members (all the railroads, AAR, IDOT, CDOT, and the CTCO), is responsible for approving any changes to the CREATE project list. All its decisions must be unanimous but can be appealed to the Stakeholder Committee.
- A Public Information Working Group (with 11 members, as described for the Management Committee) is responsible for working with public groups, individual cities and others seeking information and changes in the CREATE project plan.

The Joint Statement of Understanding describes how changes must be evaluated and when new environmental and other approvals are needed. It generally describes the responsibilities of the various parties and the authority of the governance organizations. Combined, the agreements and undertakings define a network of working arrangements without forming a legal entity (e.g., an authority or a private corporation). Given the number of entities involved and

the very special interests of all the parties, the requirement for unanimous agreement is probably one part of the structure that keeps all the parties talking with each other.

Since the CREATE Program was created in 2003 or so, individual projects have proceeded and several revised "Feasibility Study" reports issued reflecting the changes. The text box below shows project progress as of the beginning of 2012.

Chicago CREATE program

At a revised estimated cost of $3.8 billion, CREATE aims to decrease vehicle congestion caused by the movement of freight trains through grade separations along busy corridors, and to improve the efficiency of rail traffic on four vital freight rail corridors and one passenger corridor, through the completion of 70 infrastructure improvement projects. The breakdown includes 25 overpasses or underpasses, six flyovers, 36 projects focused on upgrading the tracks, signalization and control switches, and three other projects. Upon completion, CREATE is estimated to result in benefits of $28.3 billion over 30 years after project completion. As shown below, funding received by January 2014 had amounted to $1.2 billion, leaving a funding gap of about $2.6 billion yet to be filled.

Breakdown of Funding Received by CREATE as of January 2014

Partners	Funding (millions)
Private Railroads	$234
Chicago DOT	$10.1
Illinois DOT	$410
Federal Sources	
American Recovery and Reinvestment Act: High-Speed Rail	$133
TIGER IV Grant	$10.4
TIGER I Grant	$100
SAFETEA-LU Projects of National and Regional Significance	$100
Federal Rail Line Relocation Funds	$1.9
Pre-CREATE funding (various sources)	$236.6
Total	$1,236

Source: CPCS analysis of CREATE Program Overview, January 2014. Available at: http://www.createprogram.org/linked_files/2014_1_16_CREATE%20Overview.pdf

Project Issues

The CREATE project is quite complicated and the project list is a result of many trade-offs between communities, railroads, passenger transport needs and highway departments. Some critical projects are relatively small and can be done with "conventional" state and railroad financing. Others are more comprehensive and need federal funding. So far, the funding has come from a number of state and federal sources, some through TIGER grants, others through line-item inclusion in federal transportation programs (e.g., SAFETEA-LU and ARRA-high-speed rail programs). Future funding is expected to come from similar sources.

Railroad contributions are complicated by changes in ownership that continue to occur and by new legislation that requires new safety investments: railroads are required to install PTC train control capabilities, for example. This may change the mix of investment responsibilities. The length of the program may lead to public exhaustion (i.e., "another big construction project" or closure of a road crossing that has become a part of a favorite "shortcut"). The State of Illinois budget and its ability to finance new highway projects may also become an issue unless the state budget can be relieved of some of its pension obligations. Economic growth would certainly help increase funding sources but growth has been lower than expected. As a result, political issues are likely to continue to play a significant role in the CREATE project and may delay implementation.

The railroads appear to be keen to keep the project moving and improvements from investments made to date have helped increase capacity and ease flow restraints. Just the formation of CTCO (prior to CREATE) helped improve coordination and lead to improved routings for some trains through the Chicago railway network on a day-to-day basis.

Anticipated Funding Requirements

The CREATE project still needs an estimated $2.5 billion to complete the initial (and modified) set of investments. Many of the project investment needs will continue to be funded through existing federal and state transportation programs and from the participating railroads. Some of the projects will require additional federal funding, which is anticipated to come from TIGER Grants, and from specific funding in line-item budgets in US DOT transportation budgets (extensions to the SAFTEA-LU-type bills). State funding is expected to continue to come from existing IDOT spending authority. While the state's ability to issue transportation bonds may be limited in the future by budgeting issues, the amounts required for most projects are expected to fit into the overall state budget.

The participants in the CREATE program have committed to be responsible for future maintenance and operating costs for projects they own—the owner of each infrastructure element is responsible for its maintenance and operation. This was an important consideration in the willingness of government authorities (FHA, IDOT, and CDOT) to pursue many road- and rail-related projects. The railroads committed to be responsible for maintaining and operating the projects on their property.

Anticipated Funding Model

The state has implemented a number of changes to its tax laws, including increases in income taxes, extra excise taxes, higher corporate taxes, changes in inheritance taxes, increased licensing fees and "sin" taxes. More changes in the tax code are anticipated but the shape and form of Illinois tax structures is a larger political issue than the CREATE program. CREATE does not rely on any specific funding mechanism and is not limited by these issues. The railroads provide their own funding as a part of normal financing operations. CREATE is not authorized to issue any debt instruments or use any financing mechanisms. These are the responsibility of the participants.

Potential for Alternative Funding and Financing Mechanisms

Table E-8 indicates how the funding and financing mechanisms could apply to support funding of the CREATE project.

Table E-8. Potential application of alternative funding and financing mechanisms for CREATE.

Service or Asset-Related Revenue (Funding) Mechanisms	Potential for CREATE
Market Pricing to Maximize Fare Box Revenues (6.4.1)	Freight railroads already use market pricing for the most part. Rail prices are typically quoted across railroads and interchanges. Railroads have longstanding and often elaborate interchange and cost agreements where detailed cost accounting provides the basis for charges between each other for interchange services, including switching. Market pricing for interchange movements (e.g., higher prices for more urgent or valuable train movements or penalties for delayed movements) would require changes in these agreements. Such changes fall outside the scope of the CREATE program because the railroad contribution has been defined by project and for the program as a whole. Commercially viable projects within the CREATE program that involve private freight railroads will likely proceed under private railroad financing with revenue from commercial activities. Low potential.
Premium Services to Increase Service Revenues (6.4.2)	For freight, this is simply an expansion of market-based pricing – charging higher prices for special service (e.g., expedited service for container trains) or for charging different prices for certain types of trains or commodities (e.g., for unit coal trains, unit oil trains, or unit grain trains). This is not likely to affect funding of those CREATE projects that involve significant public benefits. Low potential.
On-board and In-Station Retail Concessions (6.4.3)	These revenues are not expected to affect much the ability of METRA and Amtrak to finance projects that are designated as their responsibility. Low potential.
Track Access Charges (6.4.4)	Depending on how the improvements are made, they will probably be partly paid for through some sort of track-access charging system. Railroads typically charge an access-type fee for the use of key facilities. The Huey P Long Bridge, owned by the New Orleans Public Belt Railroad (itself owned by the City of New Orleans through the Public Belt Railroad Commission) charges access fees based on train movements and the tonnage of freight movements. If a CREATE authority or enterprise were established, it would likely raise revenue through track-access fees. With the notes about the potential for market pricing above (e.g., for expedited service), and a project that provided sufficient capacity to be able to offer such expedited services, pricing could be both cost based and competitive. High potential.
Selling or Leasing Access to Railroad Rights of Way (6.4.5) (The operator and the owner may be different, which is often true of passenger operators. The benefits go to the owner.)	See note about revenue from selling additional services above. Most freight railroads currently sell easements to their right of way for electrical power, fiber optical lines and other uses. Most of the lines in the Chicago area already have easements and sales. Passenger operators (METRA and Amtrak) already lease out space in stations. Medium potential.
Commercial Property Development/Joint Development (6.4.6)	Railroads are commercial entities and already rent/sell and develop property they own. Not expected to be a critical source of funding for CREATE projects. Low potential.
Branding, Sponsorship, and Naming Rights (6.4.7)	This source appears to have minimal value for CREATE rail lines, even if an authority or joint private enterprise were formed. Low potential.

(continued on next page)

Table E-8. (Continued).

Public Revenue (Funding) Mechanisms	Potential for CREATE
Incremental Property Tax Revenues (for Tax Increment Financing) (6.5.1)	Railroad property is already subject to property taxes; additional tax revenue may drive rail traffic to other gateways. Low potential.
Special Assessment District (SAD) Fees (6.5.2)	This is a possibility for the public portion of funding needs. Political issue involved in greater Illinois budget problems. Medium potential.
Impact Fees Charged to Property Developers (6.5.3)	Not under consideration. Low potential.
Station Parking Charges (6.5.4)	Station parking charges could be increased by METRA and Amtrak and serve as a source of funding for the projects that affect them. Medium potential.
Road Tolling/Congestion Charging (6.5.5)	Road tolls and road congestion charging could be used to support shared facilities. High potential.
Heavy Goods Vehicle (Truck) Charges (6.5.6)	Heavy vehicles taxes may provide funding for public investments. High potential.
Gas Tax (6.5.7)	Gas taxes could be used to support both road and rail investments but are politically difficult to increase. The CREATE project is a set of local investments. Increasing state or federal gas taxes to support local investment efforts, especially those oriented to improving rail freight traffic flows, even if there are large and overwhelming local public benefits, is problematic. High potential but unlikely.
Car Registration Plate Auction (6.5.8)	Like increases in gas taxes, increases in registration fees could be used to support both road and rail infrastructure investments. It is politically difficult to increase taxes, car ownership costs and other mechanisms to support local infrastructure investments. Medium potential and unlikely.
Motor Vehicle Registration Fees (6.5.9)	See comments above. Difficult to pass for a locally oriented investment. Medium potential and unlikely.
Vehicle Mileage-Based User Fee (6.5.10)	Vehicle mileage-based user fees could be used to support these and other rail and transit-related projects. A one cent per vehicle mile user fee in Illinois would raise over $1 billion in revenue that could be used to finance not only the CREATE project but also transit and road maintenance projects throughout the state. Implementation of such user fees or tax structures is politically difficult. High potential but unlikely.
Payroll Taxes Used for Transport (6.5.11)	Local payroll taxes could be used to raise general funds for transport projects. These have not been considered for the CREATE project. Low potential and unlikely.
Sales Tax (6.5.12)	Similar to the other tax-related issues. Not likely to be applicable for a local project that improves rail performance, even if there are large road transport and other social benefits. Low potential and unlikely.
Carbon Tax or Credits (Cap-and-Trade) (6.5.13)	Not applicable in Chicago or Illinois at this time. Low potential.

Table E-8. (Continued).

Financing Mechanisms	Potential for CREATE
Public-Private Partnerships (PPPs) (6.6.1)	CREATE is a public-private partnership. In this case, it is defined by a set of contractual agreements, legally binding statements of understanding, and a set of oversight structures established by agreement. It does not have its own financing mechanisms. Rather, financing is provided by the participants as required by each project. High potential.
Equipment Trust Certificates (available to private companies) (6.6.2)	Railway rolling stock is not really a significant part of the CREATE effort. Private railroads may use this mechanism to finance equipment that operates over CREATE-developed facilities but this mechanism is not available to finance CREATE projects themselves. Low potential.
Operating Lease Certificates (available to private and public companies) (6.6.3)	The particular form of financing the investments needed for the rail improvements to CREATE will depend on the project and the mechanism developed to structure the investment program. It is likely that some equipment (e.g., construction and maintenance equipment) will be leased for the work. Some facilities could be constructed on an operating lease basis but it would depend on who owned the facilities and the structure of how they were controlled. Medium potential.
Finance or Capital Leasing (private and public companies) (6.6.4)	Capital or finance leases might be used, as with operating leases, depending on how individual project elements are structured. Some elements of the project could be paid for by private railroads and leased to a public entity (e.g., an authority or other private enterprise) for joint operation. This could be the best way to make improvements that will be financed in part by public grants but where the underlying property is privately owned. Medium potential.
Bonds with Public-Sector Backing (6.6.5)	This is a likely source of investment funds for the project. The primary issue will be the IDOT bonding authority. High potential.
Corporate Bonds (available for private entities) (6.6.6)	Not applicable to CREATE. The individual railroads use corporate bonds (and stock sales) as a part of their overall financing strategy. Low potential.
Mezzanine Financing (available to both private and public companies/authorities) (6.6.7)	This may well be used by construction contractors to finance their outlay and by any closely owned joint private enterprise set up to facilitate the construction of the set of investments needed to implement the CREATE improvements. Medium potential.
Short-Term Corporate Line of Credit Financing (6.6.8)	It is likely that contractors have and will continue to use short-term line-of-credit type financing to mobilize construction activities for the projects that are part of the CREATE process. It is not a significant portion of the railroad financing mechanism for CREATE. Low potential.
Sale of Stock (Ownership Stake) (6.6.9)	Not applicable to CREATE. No potential.
Tax/Investment Credits (6.6.10)	Tax credits and investment tax credits would be used to reduce the cost of investments by the private railroads. They would not be useful to public agencies that do not pay taxes. Medium potential.

Abbreviations and acronyms used without definitions in TRB publications:

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation