NCHRP
REPORT 657

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Guidebook for Implementing Passenger Rail Service on Shared Passenger and Freight Corridors

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

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FOREWORD

By Lori L. Sundstrom
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This Guidebook will aid states in developing public–private partnerships with private freight railroads to permit operation of passenger services over shared-use rail corridors. The Guidebook should encourage the broad acceptance of improved principles, processes, and methods to support agreements on access, allocation of operation and maintenance costs, capacity allocation, operational issues, future responsibilities for infrastructure improvements, and other fundamental issues that will affect the ultimate success of shared-use passenger and freight agreements between public and private railroad stakeholders.

The United States is experiencing increasing congestion on the nation's highways, as well as capacity constraints on the national rail system. Higher gasoline prices and concerns about greenhouse gas emissions are increasing public demand for energy-efficient transportation alternatives. Faced with these challenges and increased emphasis on multi-modal planning under federal transportation statutes (i.e., ISTEA, TEA-21, and SAFETEA-LU), state interest in intercity passenger and commuter rail development has grown significantly in recent years.

Thirteen states support Amtrak service and thirty-eight states have developed or participated in developing plans for enhanced intercity passenger rail service. A growing number of commuter rail systems operate on lines of various ownership configurations (e.g., freight railroad, county, city, state, and transit authorities). AASHTO's report *Intercity Passenger Rail Transportation* (January 2003) documents $17 billion in state-defined infrastructure and equipment needs over 6 years and another $43 billion in needs over the next 2 decades. Eighty percent of these needs involve investments in privately owned freight corridors. Several states have well-established rail passenger programs through which capital and operating funds are provided to ensure intercity, commuter, and transit services. Other states are beginning to implement rail passenger service plans and projects. Most of these rail services will operate on freight corridors. The concept of passenger and freight operations co-existing in shared-use corridors is central to further development of state-supported passenger rail service in the United States. All current Amtrak service is on shared-use corridors. Virtually all plans for enhanced passenger rail service, both intercity and commuter rail, developed by states are based on the shared-use corridor concept.

Recent federal legislation—including the American Recovery and Investment Act of 2009, the Capital Assistance to States–Intercity Passenger Rail Service provided for in the 2008 Department of Transportation Appropriations Act, and the Passenger Rail Investment and Improvement Act of 2008—is providing significant new federal funding for passenger rail service, prompting a number of states to expand or initiate service. This new funding is coming at a time when there is no broadly accepted methodology for conducting the long,

costly, and often mutually frustrating negotiating process with freight railroads in an equitable manner that ensures (1) that the public interest is served and (2) that private freight railroads have a reasonable incentive for entering into such agreements. The lack of such a methodology can increase the likelihood of significant delay or can even jeopardize project implementation.

Under NCHRP Project 08-64, "A Guidebook on Improved Principles, Processes, and Methods for Shared-Use Passenger and Freight Rail Corridors," ICF International was asked to develop a guidebook that would assist states in understanding the variables, challenges, and opportunities associated with starting or expanding passenger rail service on track owned by a freight railroad in a shared-use corridor. To meet the project objectives, the research team examined extant literature; reviewed current negotiation practices used by public and private rail entities; described factors that contribute to successful agreements; and prepared case studies that demonstrate the application of effective principles, processes, and methods. This Guidebook should be of immediate use to state rail programs as they determine how best to approach this highly complex situation.

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CHAPTER 1

Introduction, Background, and Purpose

1.1 Introduction

The past decade has seen substantial growth in the U.S. passenger rail usage. Over the 10 years from 1999 to 2008, trips on commuter rail systems increased by 29 percent and Amtrak intercity trips grew by 33 percent. New and expanded commuter and corridor-type intercity services have been introduced in several regions. At the same time, rail freight revenue ton-miles grew by 25 percent. Both passenger and freight growth have been driven by increasing fuel prices, highway and airport congestion, environmental concerns, and an increasing emphasis on multimodal planning in recent transportation legislation. Although the recession in 2008 and 2009 sharply reduced freight traffic and flattened passenger travel, this growth is likely to continue and accelerate as the economy recovers. Continuing substantial growth in rail passenger service is expected as a result of legislation in late 2008 and early 2009. The Passenger Rail Investment and Improvement Act (PRIIA) of 2008 and the American Recovery and Reinvestment Act (ARRA) of 2009 established new programs and procedures for funding and grant awards for intercity passenger rail investments, supported by substantial funding for intercity passenger rail projects. ARRA also provided substantial additional funds for the Federal Transit Administration (FTA) New Starts program, which supports many commuter rail developments, and mode-flexible transportation funds to state departments of transportation (DOTs).

Almost all passenger rail initiatives envision implementing new or expanded service on existing freight and passenger rail corridors and track. However, the steady growth of rail traffic, especially freight traffic, has led to localized railroad capacity problems and the potential for more severe capacity constraints in the future. Growth in passenger ridership has resulted in similar capacity constraints on some commuter networks. Many rail freight corridors proposed for new passenger service have not seen passenger service for decades and have been optimized for freight operation. Even proposals for true high-speed rail, such as that developed by the California High Speed Rail Authority, plan to share existing rail corridors for portions of the route.

The combination of ongoing growth of existing freight and passenger services and rising demand for new service has created a difficult negotiating environment for passenger rail interests seeking access to existing rail lines, especially those owned by freight railroads. Freight railroads are often reluctant to commit capacity to a new passenger service that may be needed for their own services in the future and are finding it difficult to meet the passenger service performance requirements, such as short journey times and acceptable on-time performance (OTP).

A further result of the expansion of passenger rail initiatives is that many more local, state, and regional transportation agencies, their staffs and consultants, and other stakeholders are becoming involved in passenger rail matters. Many of these organizations and individuals are unfamiliar with the railroad industry and the issues that confront officials implementing and operating successful passenger rail services. This Guidebook had been developed to help these officials and

stakeholders, whether experienced or not, to overcome the barriers and successfully implement new or expanded passenger rail service on shared passenger and freight corridors.

In summary, a Guidebook is needed because of:

- Continuing and growing interest in implementing new passenger rail services (both commuter and intercity) on existing rail corridors, most of which are currently in use for freight service.
- Frequent delays and difficult negotiations with host railroads encountered by agencies seeking to implement service and maintain service quality and performance.
- A lack of readily available information for agencies and staff who are unfamiliar with the railroad industry.

This Guidebook will assist these officials and other stakeholders in navigating the complex processes involved in implementing new or expanded passenger rail services on shared corridors. Note that this Guidebook is not a complete guide to implementing and operating a commuter or intercity passenger rail service, but rather concentrates on establishing mutually acceptable contracts and working relationships where the passenger service shares the corridor with other rail service providers. This Guidebook has been developed under the auspices of NCHRP Project 8-64, "A Guidebook on Improved Principles, Processes, and Methods for Shared-Use Passenger and Freight-Rail Corridors."

As many users will be aware, this Guidebook is being published in a period of rapid change in laws, regulations, and procedures applicable to passenger rail initiatives. PRIIA and ARRA tasked the United States Department of Transportation (U.S.DOT), Federal Railroad Administration (FRA), Surface Transportation Board (STB), and Amtrak with taking a variety of actions relating to passenger rail service—many of which will have a bearing on material presented in this Guidebook, but are yet to be completed. In addition, the Railroad Safety Improvement Act (RSIA), passed in a legislative package with PRIIA, mandated changes in safety regulations that will impact passenger rail developments. Implementation of RSIA requirements is also in progress. In spite of this fluid situation, NCHRP has determined that the interests of stakeholders, many of whom are actively involved in ongoing passenger rail projects, are best served by early publication of this Guidebook, indicating where content is likely to be affected by ongoing activities by federal agencies and Amtrak. Consideration is being given to preparation of an additional guidebook volume or supplementary report at a later date, which will update this Guidebook and provide more detail in selected areas.

1.2 Background and Present Situation

1.2.1 Historical Background

The present day structure of the U.S. passenger and freight railroad industry and accompanying legal and institutional arrangements have evolved over the past 50 years. Existing intercity and commuter rail agencies were established in their present form at different points in time over this period, in response to local and national circumstances in the rail industry. An understanding of the history and how it has led to the current situation will help passenger authorities develop realistic plans for new services and conduct effective track-sharing negotiations with other railroad operators whose actions and attitudes have been influenced by this history. A summary is provided in the following paragraphs. More comprehensive descriptions are provided in the appendices.

Prior to 1960, the major railroads directly provided freight and all types of passenger services and were required by Interstate Commerce Commission (ICC) regulation to maintain these

services for the public. By the start of the 1960s, growing competition from air and highway modes and regulatory and institutional rigidity led to the rapidly worsening financial condition of the rail industry. This financial condition led to deteriorating service, service abandonments, and bankruptcies. Out of necessity, state and federal agencies were drawn into supporting passenger rail services. Initially, public agencies became active in supporting essential commuter rail services in major metropolitan areas, aided by limited funding from the newly established Urban Mass Transit Administration (UMTA, later FTA) after 1965.

The trigger for more far-reaching change came in 1970, when the Penn Central Railroad, which dominated rail service in the northeast United States, declared bankruptcy. Penn Central's dire financial condition, compounded by badly deteriorated physical condition and chaotic operations threatened passenger and freight service over a large area of the United States. All other significant northeastern railroads also fell into bankruptcy at around the same time. Over the next decade, Congress responded with a series of major legislative actions and funding initiatives designed to preserve rail freight service in the Northeast and, ultimately, place it on a self-supporting basis in the private sector. At the same time, this legislation shifted responsibility for passenger service, both intercity and commuter, to the public sector, including transfer of ownership of the principal commuter rail networks and the Northeast Corridor (NEC) to publicly funded entities. The purpose of shifting passenger service away from the freight carriers was twofold: (1) to take the financial burden of money-losing passenger carriage off the freight railroads and (2) to preserve passenger service. Although the crisis originated in the Northeast, the resulting legislation changed the railroad industry nationwide.

In 1970, the Rail Passenger Service Act created Amtrak to operate intercity passenger service. In return for relief from the burden of passenger service, the participating railroads were required to give Amtrak rights of access to their networks and agreed to an avoidable-cost formula for track-use charges. During the restructuring of the bankrupt northeast railroads into Consolidated Rail Corporation (Conrail), Amtrak also acquired ownership of most of the NEC between Boston, Massachusetts, and Washington, D.C.

In 1976, Conrail was founded as a government-owned freight railroad to take over the assets and services of the bankrupt northeastern freight carriers. Substantial funds were also provided to offset continued operating losses and to overcome deferred maintenance.

The Staggers Rail Act of 1980 finally relieved all freight carriers from most, though not all, federal regulation of rail rates and services and simplified the regulatory process associated with railroad mergers, line sales, and abandonments.

Finally the Northeast Rail Service Act (NERSA) of 1981 separated passenger and freight services in the northeast, allowing Conrail to develop as a purely freight railroad and return to the private sector. State and local agencies in the Northeast became fully responsible for commuter rail services, in most cases by establishing their own commuter rail operations.

These measures were successful. After massive downsizing, Conrail prospered and was privatized in 1987, and the entire rail freight industry entered a new era of sound financial performance. The commuter agencies also prospered with new equipment, some new routes, and ridership growth.

Outside the Northeast, responsibility for commuter rail services in Chicago and San Francisco were transferred in stages to regional public transportation agencies, which either set up their own operations or contracted for operations and maintenance (O&M) with Amtrak or the freight railroad that formerly operated the service.

The commuter rail agreements were purely local in nature and did not include any nationwide rights of access to rail freight networks for commuter rail services or generally applicable

formulas for cost sharing. The focus of the participants was to preserve existing commuter services, not to lay the groundwork for future expansion of commuter rail service.

After the Staggers Act, NERSA, and the privatization of Conrail, there was no major legislation affecting the railroad industry until late 2008. Now clearly separated into intercity, commuter, and freight railroads, each industry segment was able to focus activities on its own markets.

In the years following the Staggers Act, the freight railroads aggressively downsized, merged with each other, closed or sold underutilized lines, dramatically cut costs, and greatly improved their productivity and financial performance. From 1980 to the mid-1990s, there was some growth in rail traffic, mostly because of the growth of massive low-sulfur coal mines in the Powder River Basin in Wyoming. Otherwise, railroads focused on squeezing more profit from a roughly static volume of traffic. From the mid-1990s, freight railroads began seeing real traffic growth driven by further increases in coal traffic from the Powder River Basin; rapid growth in intermodal traffic, especially international container traffic entering rail networks at West Coast ports; and a robust economy.

Commuter rail services also entered a period of expansion. The long-established systems experienced traffic growth, and several cities and regions were able to implement entirely new commuter services, aided by New Starts funding from the FTA. Most notably, the Southern California Regional Rail Authority (SCRRA) was established in the Los Angeles area and now operates seven commuter rail routes over 388 route miles. New commuter services were also introduced in the Virginia suburbs of Washington, D.C; Miami/Fort Lauderdale, Florida; Seattle, Washington; Albuquerque, New Mexico; San Diego and San Jose, California; Nashville, Tennessee; and Dallas, Texas. Several other services are in the planning stages.

Development of Amtrak intercity services between the early 1990s and 2008 was uneven. In the Northeast, a major project to extend electrification from New Haven, Connecticut, to Boston, Massachusetts, was completed in 1999, followed by the introduction of Acela high-speed train sets in 2000. California has made substantial investments in corridor services, which with the provision of operating support to Amtrak, has resulted in large gains in ridership. Smaller-scale initiatives by state agencies in the Midwest, Pacific Northwest, Maine, and elsewhere have allowed additional trips and service improvements on a smaller scale than that in California. However, outside the state-supported corridors and the NEC, the lack of funding has meant that there has been little service development.

More detail about these developments are provided in the appendices, including the legal and institutional structures applicable to the railroad industry and specific case studies of passenger rail developments and development processes.

1.2.2 The Present Situation

Multiple commuter and intercity passenger rail initiatives are under development, almost all of which anticipate using existing freight rail corridors and/or tracks. Even proposals for a true high-speed rail network in California envision using existing rail corridors for portions of the route and track-sharing with an existing commuter rail line between San Jose and San Francisco. Beyond the incremental expansion of conventional intercity passenger rail services, many states have banded together to propose improved regional rail passenger service over existing railroad rights-of-way, in many cases including higher-speed operation up to 110 mph. The most extensive plans have been developed by a consortium of Midwestern states, and similar efforts are under way in Virginia and the Carolinas, Florida, and California.

Concurrent with this passenger rail activity, improved freight rail service quality, expanded international trade, increased costs and congestion in competing modes, and robust demand for

low-sulfur coal for electricity generation, among other factors, have led to significant and continuing growth in rail freight traffic. The privately owned freight railroads have been investing heavily to meet this demand, but at least before the traffic downturn of 2008–2009, local capacity and other operating problems were emerging, especially around major terminal and interchange areas.

Although advocated by some, building new rights-of-way for passenger rail service is not a realistic option in most cases. With few exceptions, anticipated patronage and revenue and available capital funds simply cannot support the investment required. This situation leaves shared use on mixed passenger and freight corridors as the only practical option for most new or expanded passenger rail services, in spite of the challenges of growing passenger service on corridors shared with heavy North American–style freight operations.

Past and anticipated future freight traffic growth means that passenger-rail interests face increasingly difficult negotiations and higher costs for access to freight lines for new and expanded service. In addition, the quality of existing services can deteriorate due to rail traffic congestion, and old agreements may have to be renegotiated to ensure adequate service. Even for Amtrak-operated intercity services where Amtrak has a statutory right of access and dispatching priority, good service requires the cooperation of the owning freight railroad and sometimes funding to overcome operating bottlenecks.

1.3 Scope, Purpose, and Content

1.3.1 Scope

This Guidebook addresses principles, processes, and methods for the implementation and operation of rail passenger services on rail corridors that are shared by passenger and freight services and that are part of the **General Railroad System of Transportation in the United States.** The owner of the corridor is normally known as the **host railroad,** and other rail services operating over the corridor are known as **tenant railroads.** Normally the host railroad is also responsible for day-to-day operation of the corridor (e.g., dispatching and track maintenance), but, in a number of cases, host railroads have contracted or delegated operating responsibilities to another party. Most railroad corridors in the United States are private facilities, and tenant rail services must negotiate an access agreement with the host railroad that specifies access terms and payments. Multiple sharing scenarios exist; the passenger operation may be either the host or the tenant, and sharing configurations can vary—they may be between a passenger and a freight railroad, two passenger services, or three services as where freight, Amtrak intercity, and a commuter service operate over the same corridor. Some examples of sharing scenarios include:

- Where a freight railroad is host to commuter or Amtrak intercity passenger service, or both, on the same corridor. This arrangement is one of the most common and is the principal focus of this Guidebook. Most of Amtrak corridor and long-distance services outside the Northeast are operated on host freight railroads.
- Where a passenger rail agency acquires a corridor for passenger rail service and gives track rights to a freight railroad to allow continuing (usually local) freight service. Arrangements of this type exist on almost all corridors purchased by a public authority for (primarily commuter) rail passenger service.
- Shared intercity and commuter rail operations on infrastructure owned and/or operated by Amtrak or the commuter rail agency. The NEC and connecting lines include examples of both Amtrak and commuter-owned or -operated infrastructure, and situations where Amtrak is responsible for operating infrastructure owned by a commuter rail agency. For example, Amtrak operates the portion of the NEC owned by the Massachusetts Bay Transportation Authority (MBTA) and hosts contractor-operated MBTA commuter services.

- Time-separated shared-track freight and diesel light rail services (i.e., using non-FRA-compliant vehicles), as on New Jersey Transit's River Line between Trenton and Camden.
- Three-way sharing of intercity, commuter, and freight operations on freight railroad tracks, such as on BNSF Railway Company lines around Seattle and on Chicago commuter routes.

All the previous examples are of shared corridors that are part of the General Railroad System of Transportation. This term has a specific meaning, referring to the interconnected network of railroads in the United States. Urban rail transit lines that are not connected to the general railroad network are not included, nor are rail lines within a private facility, such as a manufacturing plant. This definition is significant because it is used in the definition of applicability for most FRA safety regulations and for various other statutes, regulations, and government programs applicable to railroads and railroad employees.

This Guidebook addresses passenger and freight services on the General Railroad System rather than dedicated high-speed corridors. A **shared-use railroad corridor,** as defined by the FRA, is a broad term that includes three different sharing arrangements, specifically:

- **Shared track,** where the trains of two or more rail service providers operate over the same tracks.
- **Shared right-of-way,** where two rail services are operated on separate parallel tracks having a track centerline separation less than 30 feet. Separation of 30 feet or less triggers the application of certain FRA safety regulations. Separation also may be referenced in shared-corridor agreements between railroads, for example, as limiting the kinds of permitted operation or requiring specific safety precautions.
- **Shared corridors,** where track centerline separation is between 30 and 200 feet. Two hundred feet is considered the outer limit of separation where an accident on one line could interfere with operations on the other.

Although shared-corridor arrangements are considerably diverse, common and very challenging situations occur when a new or expanded passenger service seeks to operate on the tracks of a busy corridor owned and operated by a major freight railroad, where the freight railroad will be the host for the new service. This Guidebook will focus on this scenario without, however, neglecting other ownership/operation/service mix scenarios.

In almost all cases, state, regional, and local governments establish specialist agencies to manage the funding, development and operation of passenger rail services. These agencies go under a variety of titles, depending on local laws and practices, and in this report are referred to generically as either passenger rail agencies, which could be responsible for any type of passenger rail service, or commuter rail agencies, which are only concerned with commuter service. Specific agencies are referred to by name in this report.

1.3.2 Purpose

The purpose of this Guidebook is to provide comprehensive support and guidance for passenger rail authorities seeking to initiate, expand, and operate passenger rail services on shared passenger and freight corridors. The primary desired types of guidance identified by the project team and expressed by passenger rail agencies can be categorized in the following areas:

- Guidance on how to manage negotiations with the freight railroad to reach mutually acceptable agreement and on how analytical methods play a role in reaching that agreement. This area includes the planning and preparations needed before in-depth negotiations, an understanding of the legal rights and responsibilities of each party (including the difference between Amtrak intercity service and commuter service), an understanding of the business needs of

the freight railroad partner, and information on how to keep all stakeholders informed without betraying confidential information.
- Methods to determine requirements for increased capacity and upgrades to track and signaling systems, accommodating both the planned passenger service and expected freight traffic, estimating the specific investments required, and determining how such investment could be shared between public and private sources. Related matters are technical regulatory requirements for track quality and signal system capabilities for passenger service, models used for capacity analysis, and how to allow for future growth of passenger and freight traffic.
- Methods to arrive at equitable sharing of ongoing operations, maintenance, and replacement expenditures to ensure that the corridor will provide the required level of service for all users. This area includes cost modeling methods; how to adjust for infrastructure investments made by the passenger agency; and the effects of train speed, axle load, grade, and curvature on costs.
- Methods and processes to address further corridor development related to operating experience and increased passenger and freight traffic, including both capital improvements and sharing ongoing O&M costs. Almost all shared rail corridors are works in progress rather than one-time developments. Both parties expect traffic volumes and service quality expectations to change over time, and provisions must be made for agreements to be updated to reflect these changing business conditions.
- Principles, methods, and processes for reaching agreement on the ongoing management of passenger rail service quality, including performance criteria, dispatching priorities, OTP, and track quality.

1.3.3 Content

This Guidebook identifies what principles, processes, and methods contribute to the successful development and operation of passenger rail services on shared-use corridors. It also provides suggestions for improvements that would address deficiencies in present practices and further enhance the success of passenger rail services.

The information is provided by subject area, roughly following the sequence of actions needed to implement and sustain a successful passenger rail service. A discussion of relevant legal and institutional factors that will underlie passenger rail service through the implementation process—including those factors regarding access rights, liability, and cost sharing—is available in Appendix B.

This Guidebook is laid out in the following chapters:

- **Chapter 2: Getting Started and Negotiations.** This chapter covers the initial steps of defining what kind of service is planned and on what kind of railroad route(s), essential homework that must be done before contacting the railroad and Amtrak (where applicable), and integration with other activities (such as state planning, freight railroad initiatives, funding and grant applications, environmental analyses, etc., where applicable).
- **Chapter 3: Analysis and Modeling.** This chapter describes the key types of analysis needed to support shared-use planning, feasibility studies, and negotiations. The subjects discussed include rail line capacity analysis, estimating capital costs needed to provide sufficient capacity and service quality for passenger service, and analysis of ongoing operations and infrastructure costs. Descriptions of the tools and analysis methods available in each of these analysis areas are provided.
- **Chapter 4: Content of Shared-Use Access and Operating Agreements.** This chapter includes types of agreement between all interested parties, including the passenger rail service sponsor, the freight railroad, Amtrak (for intercity and long-distance service), O&M contractors (where applicable), other passenger rail operators using the same corridor, and any other involved

parties. There is also a discussion of terms of agreements (re-negotiation intervals), agreements for infrastructure investments, service quality guarantees and incentives, and similar material.

- **Chapter 5: Ongoing Management of Shared-Use Operations.** This chapter provides guidance on service quality monitoring, management and incentive schemes, approaches to periodic updating of shared-track contract details within the framework of an operating agreement, approaches to addressing service quality problems (such as poor OTP), and managing ongoing relationships with all stakeholders having a bearing on service quality.

Appendices cover the following subjects:

- **Appendix A: The U.S. Railroad Industry.** This appendix provides a summary of the evolution of the railroad industry, which led to the current industry structure. This is followed by descriptions of the types of passenger and freight railroads, federal agencies concerned with railroads, and the roles of principal railroad industry and professional associations.
- **Appendix B: U.S. Railroad Legal and Institutional Arrangements.** This appendix describes statutes, regulations, and standards applicable to the general railroad system of the United States. These include the rights and duties of Amtrak regarding access to the railroad network, the cost of that access, the criteria that determine whether a rail passenger service is considered intercity or commuter, labor relations, FRA safety regulations, functions of the STB, and related matters.
- **Appendix C: Railroad Safety Regulations.** This appendix provides a detailed description of railroad safety regulations and standards as developed and administered by the FRA and how they may impact passenger rail plant, equipment, and operations.
- **Appendix D: Case Studies of Passenger Rail Service Developments and Processes.** This appendix provides examples of passenger rail developments including descriptions of how existing arrangements evolved, how the present situation differs from that in earlier times, recent examples of successful services, and applications of key processes.

CHAPTER 2

Getting Started and Negotiations

2.1 Introduction

2.1.1 Content of Section

This chapter addresses the process of negotiating with an existing owner and operator (or operators) of a railroad corridor over which new or expanded passenger rail service is under consideration. Processes for both Amtrak intercity services and commuter operations are included. The following sections provide step-by-step guidance for getting started on this process, working through all stages to reach a successful conclusion. The specific areas addressed are:

- **Section 2.2, Planning and Preparation,** covers the essential homework that an agency planning a new or expanded passenger rail service needs to complete before approaching a prospective host railroad.
- **Section 2.3, Initial Discussions with the Host Railroad,** covers consideration of when to contact the prospective host, the nature of initial meetings, carrying out a credible feasibility study for the proposed service, and what is needed to be able to enter substantive negotiations.
- **Section 2.4, Substantive Negotiations,** provides general guidance of how best to conduct the negotiations to maximize the chance of a successful outcome and the typical factors that must be addressed. After the general guidance, specific key issues such as rail line capacity and performance requirements are discussed.
- **Section 2.5, The Liability Issue,** discusses the issue that is often the most challenging for agencies seeking to implement passenger rail service, the issue of host railroad requirements for protection against the liabilities associated with passenger operations, and how these requirements can be met.

Negotiating for access to a rail corridor for a proposed service is only one part of the effort that a state or local agency must make to establish the proposed service. The agency must also build public support for the project, develop ridership and revenue estimates, estimate costs and obtain capital and operating funds, complete permitting as required by the National Environmental Policy Act (NEPA) and other applicable state and federal legislation, secure necessary legislative actions at all levels of government, and attend to other related issues. Access negotiations must be coordinated with these activities, as indicated in the following subsections.

One factor that pervades all passenger rail planning and negotiations for shared corridor operations is the distinction between Amtrak intercity and commuter service. Amtrak's right of access to the railroad system at incremental cost and its existing operating agreements with major railroads mean that Amtrak must be involved in any intercity passenger rail development. The issues to be addressed in intercity passenger service negotiations differ substantially from those for a commuter rail initiative. The practical effect of these differences on negotiations at each stage in the process is summarized in Section 2.2 and addressed in each subsequent section as required.

2.1.2 Passenger Rail Development Timeline

Agencies embarking on development of a passenger rail service often want an estimate of the timeline for working through all the steps of planning and implementing a new passenger rail service. Unfortunately there is no single answer to this question. Almost every recent development has followed a different path, depending on the extent of prior studies and planning, how the project is funded, the complexity of negotiations with the host railroads, the extent of physical improvement needed, whether the agency has to purchase rolling stock, etc. The following list provides a few examples of recent developments with some comments on specific factors that affected timelines:

- **Los Angeles Metrolink Commuter Service on the Antelope Valley Line.** The record for the rapid implementation of rail service came immediately after the Northridge earthquake in southern California on January 1, 1994. Over a period of *6 days* commuter service was extended from Santa Clarita to Lancaster, California, with a new intermediate station at Palmdale, a distance of about 50 miles. In the following few months, 10 miles of second track were added and other improvements completed to reduce trip time from an initial 2 hours 25 minutes to 1 hour 35 minutes for the 78-mile trip to downtown Los Angeles. This emergency service was discontinued when highway repairs were completed, but later reinstated permanently. Obviously, numerous shortcuts were taken to achieve the rapid implementation, but it is an interesting example of what is physically possible.
- **The New Mexico RailRunner Commuter Service through Albuquerque to Santa Fe.** This project was initiated in August 2003 after planning studies had concluded that commuter rail was a desirable approach to alleviating some of the present and expected highway congestion in the service region. The following month, the state legislature approved a transportation funding package that included the proposed commuter service. The service was to be initiated in two phases: Phase I, a route through Albuquerque from Belen in the south to Bernalillo in the north, and Phase II, an extension from Bernalillo to Santa Fe to the north. State and local agencies immediately started working on all aspects of implementing Phase I in parallel: negotiations with the host railroad (BNSF), locating and building stations, acquisition of passenger cars and locomotives, etc. BNSF agreed to sell the line, which was already in good condition for passenger service, to the state. Cars and locomotives were obtained quickly through add-ons to existing orders by other agencies, and local communities were very supportive of the rail developments. The first phase opened for service in July 2006, under 3 years from initiation. The extension to Santa Fe, which required construction of a new alignment for part of the route and a detailed alternatives study, opened in December 2008. This project does not appear to have encountered any significant barriers, and probably was accomplished in near minimum time. The host railroad was cooperative; the rail line was in good condition; there was strong community support; and only state and local funding was used.
- **The Downeaster Corridor from Boston, Massachusetts, to Portland, Maine.** A full description and timeline for this project is provided in Appendix D. In contrast to the New Mexico RailRunner, this project is an illustration of a lengthy implementation process. It took 13 years from an initial concept proposal to initiation of service and another 3 years to resolve lingering issues with the host railroad. The Downeaster is unusual because there was no significant interest in passenger rail on the route before advocates took up the cause in 1989. Most other intercity rail corridors have a history of proposals and studies prior to the successful implementation effort and often have limited existing Amtrak service. The 13-year timeline includes 2 years that were needed for passenger rail advocates to gain a commitment from the Maine state legislature. Almost all other passenger rail developments start with required political commitments in place. Another major factor in the lengthy implementation effort was opposition from the host railroad, which resulted in 2 to 3 years of negotiations and a relatively slow construction process.

In summary, the examples suggest that a passenger rail service can be implemented in 3 to 5 years, from starting a feasibility study to operation, *provided* there are no significant problems. Of this 3 to 5 years, the feasibility study should take 9 to 18 months, depending on the complexity of the project, the level of information available from prior studies, and the extent to which a feasibility study becomes integrated with other implementation activities. If there are problems in any important area, such as resolving community objections, NEPA issues, difficulties in negotiating acceptable agreements with host railroads, or purchasing custom rather than off-the-shelf trains, then the implementation process can take much longer.

2.2 Planning and Preparation

2.2.1 Introduction

This section covers agency activities that normally precede the initial approach to a prospective host railroad. The discussion assumes that the Guidebook user is not familiar with the railroad industry and is starting from a point where little substantive planning and analysis has been carried out. Guidebook users who are more familiar with railroads or are further along in the process may disregard this material as appropriate. Also, it is important to remember that developing a passenger rail service rarely follows a neat sequential plan. Rather, it is a messy process in which different activities move at different rates, sometimes experiencing delays because a slow-moving process fails to yield timely information to enable another process to move forward. Whatever the sequence of individual activities, the planning and preparation stage precedes initial contacts with a prospective host railroad and typically will include the following activities:

- Become informed about the railroad industry, both in the proposed service region and nationally.
- Define the vision and purpose of the proposed service and how it fits with long-term state or regional transportation plans.
- Determine whether the proposed service will be a commuter or Amtrak intercity operation.
- Educate public officials and legislators regarding the passenger rail service plans and the railroad industry in general.

2.2.2 Understanding the Railroad Industry

The railroad industry can be very confusing for state and local officials unfamiliar with railroads. It is governed by its own administration within the U.S.DOT—the FRA—and a unique body of laws, regulations, practices, and institutional arrangements. The process of implementing a passenger rail project will encounter many of the requirements contained in these laws, regulations, and practices and will involve the responsible government offices and industry associations. A basic understanding of the railroad industry is essential for officials to plan and implement a passenger rail project. Absent this understanding, time and effort can be wasted pursuing unrealistic plans, making relationships with host railroads more difficult than necessary and causing failure to recognize and take advantage of opportunities. The principal areas where understanding is helpful are:

- **The rail freight business.** Freight railroads are private businesses that compete for their share of the national freight market and are important elements in the supply chains of U.S. industries (including power generation, agriculture, automobile manufacturing, etc.). Railroads also link U.S. ports with American shippers and recipients of internationally traded goods. Passenger rail is not a primary interest of freight railroad managers, who are mainly concerned that legal and contractual obligations to accommodate passenger service do not interfere with their freight business.

- **The various government agencies and industry associations** that support and regulate the U.S. railroad system. Almost all of these organizations—and the regulations, standards, and practices they are responsible for—may affect passenger service.
- **The differences between Amtrak intercity and commuter services** and Amtrak's right of access to the rail network at incremental cost. All intercity passenger rail services over existing rail corridors are operated by Amtrak; thus understanding what Amtrak does and can do is essential to planning and implementing new intercity service.

Appendices A, B, and C comprise a primer on the railroad industry and its institutions, and the Bibliography provides further sources for deeper investigation.

2.2.3 Vision for the Service and Long-Term Planning

Any state or local agency considering new or expanded passenger rail service has to manage multiple interlocking processes, of which negotiation with the freight railroad is only one. In all cases, the starting point is a vision for the service—what kind of service is desired, what communities will be served, and what kinds of benefit (improved mobility, congestion relief, etc.) are expected.

A common starting point is the recognition that additional transportation capacity is needed in a travel corridor, leading to a planning effort to consider alternatives. Another starting point can be the efforts of an individual legislator or group of legislators to build public support and initiate a study of a proposed service. Some long-range transportation plans for a state or region may propose intercity or commuter rail as a desirable solution to mobility needs (although most State Transportation Improvement Programs focus primarily on highway projects and are a requirement to access federal highway funding). Yet another source of the vision can be a citizen initiative or a passenger rail advocacy organization (as with the Downeaster service in New England). Many passenger rail initiatives now receiving serious attention have been the subject of past studies that failed to develop further, usually because of funding barriers, a change in state government policy, or a lack of consistent support at responsible government agencies. Once the vision is defined, the next stage is to build public and political support for implementing a new service. Once support is established, the process can begin.

Developing a **State Rail Plan** for freight and passenger rail services that includes the proposed service can be a key factor in the success of a passenger rail initiative. For this reason, PRIIA has made completing an approved state rail plan a requirement for approval of federal grants for intercity passenger rail service. This requirement is waived for ARRA funding in the interests of timeliness. However, this does not detract from the usefulness of planning for both passenger and freight rail requirements, intermodal connections, and interstate and international connections. The next section discusses rail plans and provides a case study of where good planning supported successful passenger rail development.

2.2.4 Role of Long-Term Planning

Some states have found that having a well-thought-out long-term rail plan helps sustain a passenger rail program, while reassuring freight railroads that their interests are receiving full consideration. The primary rationale for developing such a plan is that building a high-quality network of passenger rail services in a state or region is rarely a one-time effort and is far more likely to be accomplished through a series of incremental steps over time. A plan helps ensure that each increment constitutes not only a viable project on its own but also moves toward completing the planned network. Because almost all passenger rail developments involve sharing track and rail corridors with freight rail services, a comprehensive plan must include freight rail developments as well as passenger rail. An excellent example of a long-term plan is the plan prepared

and maintained by Washington State DOT (WSDOT), summarized in the case study below and discussed further in Appendix D.

CASE STUDIES 1
Washington State Long-Term Rail Planning

In 1993, following completion of a detailed feasibility report, the Washington state legislature directed WSDOT to develop a plan for incremental development of high-speed ground transportation in the state. The primary motivation was to relieve growing congestion on the Interstate 5 north–south corridor between Portland (Oregon) and Seattle. Shortly afterwards, an agreement was reached with BNSF to work cooperatively on railroad improvements to benefit both passenger and freight services. Although the main focus of the WSDOT plan was for passenger rail, complementary work elements were incorporated that add up to a comprehensive process for developing the railroad network in western Washington State. These include:

- Cooperative modeling and analysis of railroad capacity to establish requirements for each increment of passenger and freight service. One of the key conclusions from this modeling is that a dedicated third track will be needed south of Tacoma for passenger service if the long-term goals for trip time and ridership are to be attained.
- Development of the FAST freight rail assistance program to improve freight flows in the Puget Sound region, including to and from ports and the main lines through the Cascades to the east.
- Development of the Sounder north–south commuter rail service between Tacoma, Seattle, and Everett.

Note that the plan does not commit WSDOT to specific expenditures in each plan year. Instead, it lays out a sequence of projects to be implemented as funding and travel demand permit.

Development of a long-term rail plan begins by collecting and building on all pertinent prior surface transportation studies, including rail, highways, ports, and border crossings. The plan should articulate a long-term vision for the roles of passenger and freight rail in the state and then describe practical incremental steps to realize the vision. Given the typical time frames involved in implementing transportation projects, the plan should look forward 25 years or more. It is important to secure the cooperation of the private freight railroads in the planning effort, to make sure their interests are represented and that the completed plan meets both passenger and freight service needs. Plans should be regularly updated to reflect changing conditions and projects completed since the previous update.

2.2.5 Is the Proposed Service Amtrak Intercity or Commuter?

Negotiations over access to a freight railroad corridor and access fees for an Amtrak intercity (corridor) service are very different from those for commuter service. If it is an intercity passenger service, then Amtrak must be involved and will have a major role in the negotiations. At the same time, the state or local agency planning passenger service must negotiate with Amtrak on its costs, equipment availability, and related matters.

Commuter rail agencies are in a very different negotiating position. Amtrak is not involved, and its access rights cannot be exercised for a commuter rail agency. The state or local agency has to negotiate access and fees on its own, with little assistance from other parties. The FTA will provide capital grants for new starts or service expansions under the FTA's New Starts program to qualified applicants but provides no support during negotiations. The FRA has no role in commuter rail developments other than ensuring compliance with applicable safety regulations. However, the STB can now assist with non-binding mediation should the parties fail to agree on terms of access, thanks to a provision in Section 401 of PRIIA. Further discussion of the STB's assistance is provided in the following paragraphs and in Section B.8 of Appendix B. However, the STB is still developing procedures for commuter rail mediation, and the practical impact of this assistance has yet to be determined.

The following subsections provide an overview of the differences between Amtrak intercity and commuter rail regarding access to the railroad network and access pricing. Separate sections are provided elsewhere in this Guidebook where these differences affect the relationships between railroad operations sharing the same corridor. Note that here and elsewhere in this Guidebook, **commuter service** refers to short-haul passenger service that does not qualify for Amtrak access rights under the applicable statutes. This definition is different from that applied by the FTA and other federal agencies in determining eligibility for grants under various programs. Shorter-distance Amtrak intercity services have received grants from the FTA, such as the Downeaster service between Boston, Massachusetts, and Portland, Maine, and the service between Philadelphia and Harrisburg, Pennsylvania. These services are sometimes described as commuter services but do not fit the definition of commuter service in the Amtrak statutes and related STB and court decisions.

Amtrak Intercity Service

Any passenger service intending to secure access to the railroad network under Amtrak's rights must involve Amtrak in planning from an early stage. Amtrak must be the operator and the formal requester to the freight railroad for access under its rights. Amtrak officials responsible for state-sponsored services are available to discuss proposals and provide help in carrying out feasibility studies. Such feasibility studies should involve purely Amtrak issues, such as realistic ridership and revenue estimates, the provision and maintenance of passenger cars and locomotives, provision of train crews and choice of on-board services, and the costs associated with these functions. Issues that are of interest to the host railroad as well as Amtrak include capacity estimates, infrastructure upgrades to increase speeds and capacity, and infrastructure-related capital and operating costs.

Amtrak staff members are available to guide the state agency through this process and will usually have existing relationships with host railroad officials. They will be familiar with the railroad's likely concerns over added passenger service. However, their time is limited, and the state is likely to need additional support from consultants.

Amtrak's right of access and dispatching priority, although essential for securing access to the railroad network at favorable cost, does not guarantee high-quality service. Recent experience on Amtrak's core routes (those lacking state support) shows that maintaining adequate service quality on a busy freight corridor can be difficult. As freight traffic has increased, Amtrak has experienced declining service quality and increasing costs on some of these services. Amtrak's preferred approach to addressing these problems is to first identify the route segments where traffic congestion and slow orders are disrupting service and then work with the railroad to develop a program of improvements to address the causes of delay. The FRA has also assisted Amtrak with investigating delay causes on some routes. Often, the difficulties that disrupt passenger operations also disrupt freight operations, so there is a mutual interest in taking corrective action. Improved management focus and a structured program of problem identification and correction have generally yielded measurable improvement.

Recent developments have provided Amtrak with more capabilities to address service quality issues:

- PRIIA gave the STB the explicit task of investigating poor OTP, defined as below 80 percent on time, and making recommendations for reasonable actions to improve OTP. If the investigation finds the host carrier at fault, the STB may impose damages or other relief on the part of Amtrak. Prior to this legislation, Amtrak was limited to the performance incentives and penalties in its contracts with host railroads. Poorly performing railroads often "maxed out" penalties for train delays under Amtrak operating agreements and incurred no additional penalty for a further service degradation. Amtrak may also ask the Department of Justice to bring a lawsuit to enforce Amtrak's dispatching priority over freight trains, although this power has been rarely, if ever used.
- Starting with the modest program in Fiscal Year 2008, and with ongoing authorization in PRIIA and funding from ARRA, funds are becoming available for intercity passenger rail developments, a portion of which are explicitly designated for relieving congestion problems. For the first time, Amtrak and state agencies have capital funds with which to address congestion and delay problems that cannot be corrected by a focus on operations and maintenance issues.

Commuter Rail Service

Until recently, commuter rail service operators (defined in this Guidebook as services that do not qualify for Amtrak's access rights) had to negotiate with the freight railroads alone. They had no support from Amtrak, and there was no institutional support for them elsewhere. Before its demise in 1995, the ICC did have passenger rail responsibilities and could provide technical assistance and limited help with obtaining a fair agreement. These responsibilities were eliminated when the STB replaced the ICC, and the relevant federal agencies (i.e., the FRA, the FTA, and the STB) had, until recently, no role in negotiations for commuter rail access. This situation placed the prospective host railroad in a strong position to either refuse to negotiate or to demand a high price for accommodating passenger service.

However, PRIIA gave the STB new powers to assist agencies seeking to implement commuter rail service on freight railroad track. If the parties are unable to reach a mutually acceptable agreement on their own, the STB can conduct non-binding mediation to help resolve the situation. In spite of the non-binding nature of this mediation, it would likely be difficult for a freight railroad to reject a reasonable agreement that meets both parties' stated requirements.

Another potential barrier is that many commuter projects depend on funding from the FTA's New Starts program. Not only is the grant application process costly and time consuming, but the program also requires an agency to have a railroad access agreement in place before a grant can be approved, which places a commuter rail agency in a difficult position. The freight railroad may be reluctant to negotiate without the funding, but the passenger operator cannot assure funding before negotiations. This situation is especially difficult for new agencies lacking a record of successful grant applications. Agencies seeking to grow an existing service are in a better position to provide credible assurances that their project is eligible for FTA funding. In spite of this situation, however, passenger agencies have been able to navigate the process with flexibility from all parties. Further details of the FTA New Starts process and possible constraints on the access negotiations are provided in Appendix B, Section B.10.

Although the process of starting a commuter rail service may be frustrating and time consuming, the hurdles can and have been overcome. Several new commuter rail services operating in part over busy freight railroad–owned corridors have been initiated over the last 20 years—the Metrolink system in Los Angeles, the Sounder (Seattle to Tacoma area) services in Washington State, and the Virginia Railway Express services in the northern Virginia suburbs of Washington, D.C. Others—such as the West Side Express in Portland, Oregon; the Music City Star in Nashville,

Tennessee; and the North County Transit District service between San Diego and Oceanside, California—operate over short-line or publicly owned tracks. When funding is available, a way can be found.

2.2.6 Educating Public Officials

Uninformed comments by state and local government officials and legislators concerning access to a railroad corridor can damage relations with the freight railroad even before discussions begin. The railroad's response can be similar to that of a family learning through the press that the highway department intends to take its front yard to widen a highway. It is therefore important that public officials have a basic understanding of the freight rail business, the challenges railroads face in their operations, and problems in their current business environment that have special bearing on passenger service. Early in the process, the passenger rail agency should establish an educational outreach effort to interested agencies, legislative committees, individual legislators, and other interested parties. The focus should be on general issues of establishing a shared-corridor passenger service rather than the specifics of the proposed service. Some particular issues that should be addressed include:

- Understanding that active railroad property cannot normally be taken by eminent domain, so an agreement acceptable to both parties is essential. Amtrak does have a limited right of eminent domain, but this has only been invoked once, where a host railroad allowed severe track degradation and persistently refused to take steps to correct the problem.
- A realistic understanding of likely railroad expectations for liability protection and the approaches other passenger agencies have taken to reach agreement on this issue.
- The need for confidential negotiations and careful public communications planning during the negotiation process.
- Understanding the differences between implementing Amtrak intercity and commuter service on a freight railroad ROW.
- A realistic understanding of likely capital and operating costs. Under present U.S.DOT grant policies, grants can be applied to only capital expenses. Operating funds for both intercity and commuter services must be provided from local and state sources.

Beyond these points, however, the officials or staff directly responsible for moving the process forward must acquire more in-depth knowledge. The education process needs to start early; agency staff members new to passenger service are unlikely to be fully aware of what they need to know. Education should include review of both written materials (as referenced in this Guidebook) and one or more briefings from knowledgeable people. Amtrak, a state DOT, or another passenger rail agency can be the source of the necessary expertise. The education process will not only prepare officials for negotiation but also help them develop realistic service proposals, which can lead to mutually acceptable agreements with railroads.

Passenger rail agency staff needs a clear understanding of not only the basics of the railroad business, but also the current issues that affect railroads' attitudes towards passenger service. Clearly the negotiating environment has become more challenging in recent years, and this trend could continue. Access to freight railroad track and rights-of-way for passenger service is becoming harder and more costly to secure. The sources of this increasing difficulty include:

- The freight railroads have increased concern over their exposure to passenger-related liability. This concern is not directly caused by a specific passenger train accident or related court ruling, but rather the general increase in liability costs related to railroad accidents. Recent examples are the Graniteville, South Carolina, hazardous materials accident on the Norfolk Southern Railway system, and the passenger accidents at Glendale and Chatsworth, California, on the Metrolink commuter system around the Los Angeles area. This concern leads to demands for very high indemnification levels, as discussed later in this section.

- Rail freight traffic is continuing to increase and investment in freight capacity is needed to handle this traffic. The surge in freight traffic since the mid-1990s took some railroads by surprise, leading to congestion problems and costly investments to increase capacity. This situation makes railroads either very reluctant to commit capacity for passenger service on any line that might be required in the foreseeable future or likely to demand a high price for that capacity. The most common position taken by the railroads is that the passenger rail agency should provide capacity investments to replace capacity consumed by the proposed passenger operation. The railroad may make the argument that failing to provide adequate freight capacity may displace freight onto the highways.
- The prosperity of the railroad industry is increasing the return on rail investment and, at the same time, attracting investors that place pressure on railroad management to maximize return on their assets. This situation is likely to increase railroad reluctance to commit capacity to passenger service.
- Railroads have a generalized concern that allowing public investment in their infrastructure may compromise their future ability to respond to business opportunities and earn good profits. This fear has been heightened by public statements and publication of reports calling for extensive passenger-related investment in the existing freight network, more extensive public funding in the railroad network in general, and possible re-regulation of freight rates.

However, freight railroad attitudes and concerns are likely to evolve over time. The sharp freight traffic reductions during the economic downturn of 2008–2009, the availability of real federal government funding for intercity passenger rail, and continuing debate on both rail freight regulations and the shape of future surface transportation legislation all have the potential to change these attitudes.

Although not strictly related to shared railroad operations, research for this Guidebook has shown that relationships with intercity bus service operations and transit services in larger metropolitan areas can be important elements in developing a well-patronized passenger rail service and should receive serious consideration in planning passenger rail services. These relationships can take several forms: dedicated bus services extending the reach of the rail service to communities where direct rail service would be impractical, joint scheduling and ticketing arrangements with parallel and connecting commercial bus operators, and joint ticketing and connecting arrangements with regional commuter and transit agencies. Some examples are given in Case Studies 2, primarily taken from California, which has been a leader in this area.

CASE STUDIES 2

Bus Service Connections and Cooperation

Caltrans has set up connecting bus services from several points on state-sponsored Amtrak corridor services, most notably for the San Joaquin and Capitol corridors. The Amtrak-branded buses provide connections to communities off the rail line and are only available to rail passengers. In the case of the San Joaquin corridor, the bus service also provides a connection between Bakersfield and Los Angeles, where direct rail service would be very slow. Another bus service on this route runs between Stockton and Sacramento, supplementing a limited direct rail service. The bus services have been very successful in increasing ridership and the general usefulness of passenger rail service.

The Northern New England Passenger Rail Authority (NNEPRA), which oversees the Downeaster service, has agreements with two commercial bus operators. Both operate services generally parallel to the Downeaster route, and one has a route network that goes beyond Portland, Maine, to communities farther north and

east. Both operators were initially hostile to the passenger rail service, viewing it as unfair subsidized competition. But they were persuaded to enter into these cooperative agreements that provide for selective interchangeability of tickets and showing each others' services in their schedules. Experience has shown that the availability of more travel options has increased ridership for all parties.

2.3 Initial Discussions with the Host Railroad

2.3.1 Introduction

There are two major stages in the freight railroad discussions. First, initial discussions in the planning stage seek railroad inputs to planning and feasibility studies, and, second, the passenger rail interests come to the table with a substantive proposal. Throughout, it is essential to have a knowledgeable railroad person involved on the passenger side to counter unreasonable objections and to enable the freight railroad to feel that its concerns are understood. Indeed, the early stages of negotiations are as much a confidence-building process as it is a discussion of the specific service details. Both parties need to understand the other sides' goals for their services and develop a shared commitment to reaching those goals. The next step is to agree that technical issues affecting shared operations—such as rail line capacity, track quality and signal system requirements, capital and maintenance costs, and similar matters—should be resolved by suitable, objective, mutually acceptable analyses.

The first contacts with the freight railroad are vital. It is easy to start off on the wrong foot and then have to spend time and effort to get back on track. In addition, different freight railroads have very different preferences on when they want to become involved in a passenger rail initiative on one of their corridors. Some prefer to be involved from the earliest stages, and others do not want to devote resources to discussions before a detailed proposal is on the table. To add confusion, preferences may change over time, from region to region, or be situational, depending on the characteristics of the corridor under consideration. The key parameters for decisions about this initial approach are:

- Is the service Amtrak intercity or commuter, as discussed previously?
- Does the host railroad prefer or require early engagement, when plans are being formed, or later engagement, after a more detailed plan has been developed?
- Does the passenger agency or other state agency have an existing relationship with the prospective host railroad?

The sequence of communication activities with the railroad are illustrated in Figure 2-1.

The question of when to first approach the host railroad has the potential to cause difficulty for passenger rail agencies. A majority of passenger rail agencies state that they prefer early engagement on the grounds that the railroad will learn plan details directly from the agency rather than from press reports and railroad concerns and possible deal breakers will be identified early in the planning process. Proponents of later engagement feel that early engagement puts the railroad in a strong negotiating position against an unprepared agency team, and they advise waiting until a thorough feasibility plan is available and funding has been secured. However, late engagement also has risks and disadvantages; in particular, the feasibility study may not fully take into account railroad concerns and objections in the absence of railroad inputs.

This Guidebook strongly advises early contact with the host railroad, in cooperation with Amtrak if the service is Amtrak intercity. The passenger agency should emphasize that this is an informational contact to acquaint the host railroad with the agency's initial plans, request cooperation with a feasibility study, and identify major concerns. The agency should resist any attempt to

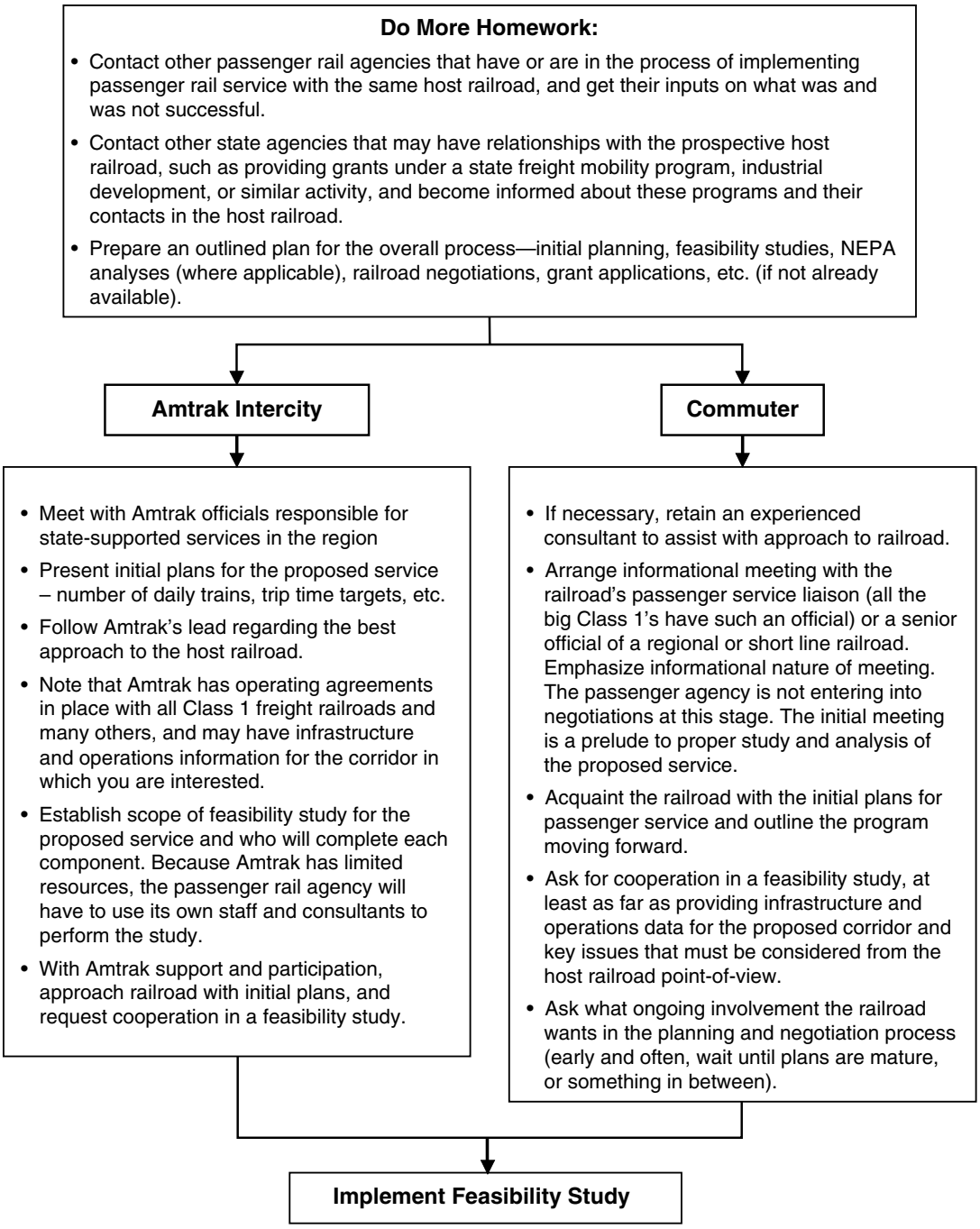


Figure 2-1. Sequence for communicating with the freight railroads.

be drawn into negotiations or agree to specific conditions for the proposed service at this stage. The response should be that specific needs for the service will be analyzed in the feasibility study and the railroad will be invited to participate in the analysis.

If, after this initial contact, the railroad states that it prefers later engagement in this project after a detailed plan is available, then so be it. It is unlikely that a railroad will feel unable to participate even in a limited fashion, such as providing route data for the feasibility study, and the passenger agency can keep the railroad updated on progress and developments.

Another factor in facilitating agreements may be the state's freight rail transportation programs. Many states have a freight rail program aimed at enhancing rail access for the region's industry and commerce and preserving lower-volume rail service where it is important to the local economy. In addition, state and local government agencies interact with freight railroads in many areas other than direct support for rail facilities and may have a number of discussions in progress at any one time. In some cases, it may be possible to incorporate both passenger and freight elements into a combined transportation initiative involving the freight railroad. In other areas, it may be possible to leverage a positive relationship with a freight railroad to enhance the chance of reaching agreement on a passenger rail project.

2.3.2 The Feasibility Study

After the initial contacts with the railroad, the next step in developing a new passenger rail service is to perform a feasibility study or build on existing studies to include detailed analysis of the proposed route, service, and operations. The feasibility study is a vital step in moving from planning and informational contacts with the host railroad to substantive negotiations. This discussion concentrates on aspects of a feasibility study relevant to negotiations with the host railroad and Amtrak.

The inputs for the feasibility study include any prior studies for passenger rail in the region served by the proposed service, the State Rail Plan (where available), the vision for the proposed service, any other previous studies, and railroad inputs. The scope and objectives for the study would have been discussed between the passenger rail agency, the host railroad, and Amtrak where applicable, at initial meetings. They are likely to include the following elements:

- **A staged plan for the introduction and growth of the proposed service.** This plan includes target journey times, planned station locations, daily trips with target departure times in each direction, and anticipated freight service on the corridor at each stage. It is assumed that passenger ridership and revenue estimates are available, indicating that the planned level of service at each would be adequately patronized, but this is not specifically part of an operational feasibility study. There does not have to be a schedule for implementing each stage, only a logical progression toward a final goal.
- **Plans for infrastructure investments** that would enable each stage of service growth to be implemented while providing adequate facilities to meet the host railroad's goals for freight service. The investments will include track quality upgrades, signal system upgrades, grade crossing warning system improvements, crossing consolidations and grade separations, the addition of passing sidings and/or a second track where required, and similar matters. Signal system requirements for positive train control (PTC) and for speeds over 79 mph must be included.
- **Plans for station locations and facilities.** These plans will include what buildings and facilities (such as parking lots) are planned, access to the station for vehicles or pedestrians (especially where access routes cross active tracks), safety of passengers while at the station and boarding trains, and whether the passenger rail agency plans to acquire railroad property for station buildings and facilities.
- **An initial capital cost estimate** for the first stage in developing the proposed service and an outline of cost estimates for later stages. The capital cost estimates should include costs to be borne by the passenger agency and the host railroad, where applicable.
- **Initial estimates for operations and maintenance costs at each level of service.** As for capital costs, estimates should be detailed for the first stage and may be preliminary for later stages.
- **Plans for funding capital and operating expenses,** including from federal grant programs, where applicable, as well as from state and local sources.

- **Requirements for passenger cars and locomotives** or self-propelled passenger cars to support the proposed services, including number of vehicles, performance requirements (e.g., top speed, power/weight ratios), whether or not electrification is planned at some stage, and whether the passenger rail agency or Amtrak will provide equipment.

The approach for a typical feasibility study is illustrated in Figure 2-2.

Some observations about the feasibility study follow:

- If at all possible, the host railroad should be closely involved in the feasibility study to facilitate buy-in with the results. This involvement will help speed up the substantive negotiations and

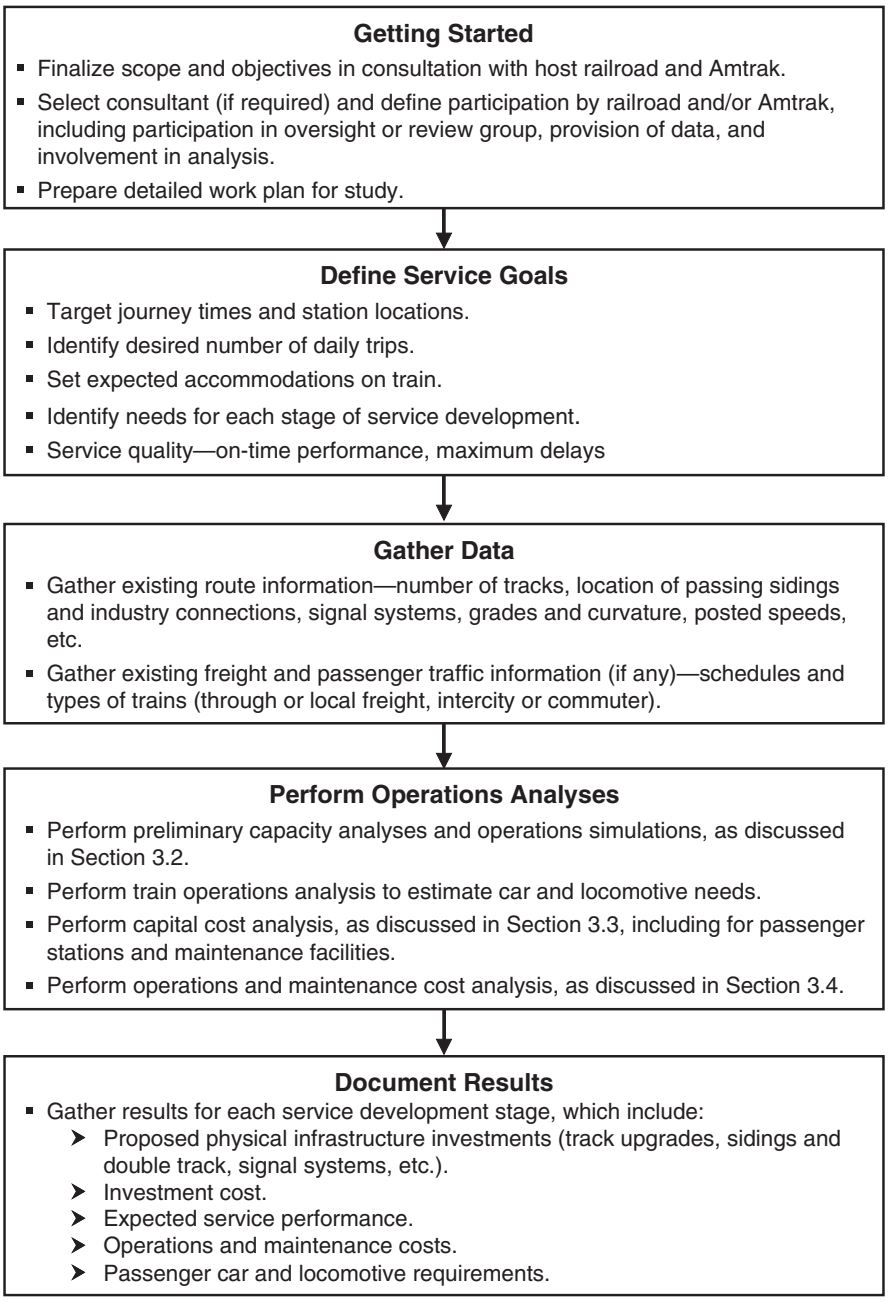


Figure 2-2. Steps for completing a passenger rail service feasibility study.

reduce the chance that further analyses will be required to address points raised by the railroad that were not fully covered in the feasibility study.

- The operations analysis is likely to be the critical step in the analysis, as it will define what is and is not possible on the corridor and the capital cost of achieving service goals. Capacity and operations analyses generally use models that simulate train operations (see Section 3.2) to determine what infrastructure improvements are needed to accommodate defined passenger and freight service. The process usually starts with a professional estimate of what is needed for the initial service, then progressively adds investments to increase speeds in slow areas and eliminate bottlenecks. The process ends when desired journey times are achieved and total delays are at acceptable levels for both passenger and freight operations. The analysis is repeated for each stage in proposed service development. Although capacity analysis can be costly and time consuming on a busy and complex corridor, this need not be the case on simpler corridors. For example, the analyses for the Downeaster service were accomplished with simple train performance calculations (for journey time and scheduling) and manual string chart analysis (for capacity). The string charts were used to determine the placement of additional passing sidings.
- It is essential to consider rolling stock needs in the feasibility study. The host railroad will want to know what is proposed in case there are operations and safety issues, and train power-to-weight ratio and traction characteristics affect performance. If an operation exceeding 79 mph or the use of non-FRA-compliant equipment is under consideration, both the FRA Office of Safety and the host railroad will need to agree to the proposed operation, including the required PTC capabilities. Also, unless Amtrak can confirm the availability of equipment for when initial service starts, the passenger agency may have to acquire new or second-hand equipment, which can be a lengthy process.
- Under RSIA of 2008, and currently proposed FRA regulations for its implementation, most intercity and commuter passenger corridors must be equipped with PTC or its equivalent. If the corridor is not already in the host railroad's PTC program, it will have to be added in most cases, and the railroad's installation plans modified accordingly. These plans and presumably any subsequent modifications must be approved by the FRA. The FRA is still finalizing PTC requirements and procedures, and those involved with a passenger rail initiative must track developments and be ready to incorporate the requirements into investment plans, cost estimates, and implementation schedules. The FRA may impose additional train control, operations, and safety requirements (for example, at grade crossings) if the use of non-compliant equipment is proposed or speeds are in excess of 79 mph.

2.4 Substantive Negotiations

Substantive negotiations regarding shared corridor access, operations, and costs can begin when the feasibility study is complete, preferably with buy-in from the host railroad, or at least an indication that proposed infrastructure upgrades will be sufficient to allow the planned initial service as well as to meet legitimate freight railroad service requirements.

As always, negotiations for intercity service that makes use of Amtrak's access rights must involve Amtrak. Because several of the issues that have to be negotiated are likely to be already covered by existing Amtrak–host railroad agreements, and others can follow established Amtrak practice, negotiations for a new intercity service are usually much simpler than for commuter service. With commuter service, the passenger rail agency, with its professional advisors, must conduct negotiations directly with the host railroad.

Before individual technical issues that are likely to be factors in the negotiations are discussed, the following general points about the approach to negotiations should be considered:

- Keep negotiations focused on thorough analyses of capacity, operations, and costs to find practical solutions that meet all parties' needs. As far as possible, avoid being drawn into arguments

based on anecdote and preconceived attitudes; rather, insist on addressing issues using mutually acceptable analysis methods to resolve questions and problems. A listing of specific, technically described benchmarks for acceptable standards of service and infrastructure should be developed and endorsed by each of the stakeholders in advance of the technical analysis.
- It is important to keep the discussions with the railroad confidential and mutually respectful until an agreement is reached. Many interviewees reported that confidentiality is critical to successful negotiations. Neither party will want disagreements exposed and debated in the press, nor will they want to expose confidential information concerning the railroad's business that may be discussed during negotiations. This confidentiality may be counter to the instincts of public officials who are used to working in the public eye and need to keep parent government departments, legislators, and the public adequately informed. In some states, "sunshine" laws may require disclosure but will allow exceptions where they can be justified. The best plan is for the negotiating parties to agree at the outset on how and when information will be communicated to the public and to address any "sunshine law" requirements up front.

The specific technical issues that are typically addressed in negotiations are:

- Passenger service parameters—such as number of trips, journey time, and reliability—and the planned service evolution.
- Specific services to be provided by host railroad and other entities.
- Access agreements and cost of access, separate from infrastructure improvements. This issue primarily affects commuter service. Amtrak intercity access is usually covered by existing agreements.
- Infrastructure investments needed to provide adequate capacity to meet capacity and journey time requirements.
- Station requirements—locations, facilities required, interface with shared railroad tracks and operations.
- Contracting arrangements for executing infrastructure projects as associated costs.
- O&M costs (primarily for commuter service).
- Liability.

The following section addresses the technical issues and suggests approaches the passenger agency can follow to secure a satisfactory agreement. It does not detail typical provisions of the final agreement between the passenger agency and host railroad—those are provided in Chapter 4—but rather discusses the process of getting from service plans detailed in the feasibility study to an agreement to operate the planned service on the host railroad.

2.4.1 Defining What the Passenger Agency Needs

The passenger agency needs the following items going into the substantive negotiations with the railroad:

- A reasonably long-term plan—20 to 25 years into the future—for the proposed service, preferably based on a state or regional long-term rail plan for both passenger and freight service. For example, if the ultimate goal is eight round trips per day to be reached over several years in various stages, as funding and ridership growth permit, then this goal should be clearly stated in the plan, even if only two round trips will be operated at first. Only negotiating for the two trips and returning to develop new agreements for added trips is cumbersome, time consuming, and costly and could lead to failure.
- Ideally, a thorough feasibility study, appropriate to the scale of the proposed service, that establishes reasonable expectations for service, expected ridership and revenue, the associated track

improvements, and capital and operating costs. The feasibility study should also include expected growth in freight traffic to ensure that freight operations will not be impacted by the passenger service.
- Regardless of the level of detail in the feasibility study, a clear description of service expectations at each stage in its development, to include the following:
  - Number of daily round trips and approximate departure times in each direction. For example, with an intercity corridor, departures may be spread throughout the day, but commuter trips would be concentrated in morning and evening rush hours.
  - Station stop locations and facilities and planned journey times.
  - Service quality parameters, such as acceptable percentages of host-responsible delayed or cancelled trains, or average host-responsible delay per train.
- For an intercity service to be operated by Amtrak using Amtrak's access, Amtrak participation in negotiations. The access agreement will be with Amtrak, which will operate the trains, usually with financial support from the state passenger rail agency. Therefore, an initial agreement with Amtrak to participate in negotiations is required. No such agreement is needed for commuter service, even if the passenger agency is considering Amtrak as a contract operator.
- Assured funding or at least a politically feasible plan to assemble capital and operating funds for the proposed service. A host railroad may be reluctant to negotiate unless it can see that funding is secured, or at least that the funding process is well advanced and the proposed service plans are credible given the funding status.
- A preliminary specification of the services desired from the host railroad. Dispatching and infrastructure inspection and maintenance are almost always provided by the host railroad. The passenger agency may be interested in other support, for example with train operations. Some railroads actively prefer to be responsible for operations, so that they do not have to work with a third-party contract operator.

Some passenger rail agencies, for their own reasons, may be interested in operating a demonstration service prior to implementing full-scale service. The service trial is intended to demonstrate feasibility to stakeholders and build support for the full service. The following services are examples where this approach was taken:

- The "Try-Rail" demonstration service on the Seattle to Tacoma route in Washington State, which preceded full implementation of the Sounder services.
- The initial service of the Altamont Commuter Express in northern California.
- The first route of the Music City Star commuter service in Nashville, Tennessee, implemented on a state-owned short line rather than a Class 1 freight railroad to reduce cost and speed up implementation.

The advantages of the demonstration service approach are that the service can be implemented quickly and at modest cost; manageable with only local funding; provide all stakeholders with evidence of success that can be leveraged to increase funding from local, state, and federal sources; demonstrate feasibility and competence in freight railroad negotiations, etc. The downside is that the demonstration could fail and damage future prospects for passenger rail in the area. Also, note that demonstration service projects are far more easily arranged on light-density or short-line properties where disruption to the normal flow of freight traffic is at a minimum. Some Class 1 carriers will categorically deny "trial" operations out of fear that downstream politics surrounding a service proposal will become ever more difficult to keep in balance with the need for freight service capacity. In this case, it is probably better to present the service as the first stage in a multi-stage development and work out an access agreement that accommodates all stages, even when timing and funding for future stages is uncertain.

2.4.2 The Access Agreement and Infrastructure Improvements

The Access Arrangement

The first issue to negotiate with the host railroad is the basic access arrangement for the corridor of interest. There are sharp differences between access for Amtrak intercity service and access for a commuter service.

Amtrak. Amtrak intercity service has the right of access. A host railroad cannot simply refuse to accommodate a new intercity service but can seek mitigation in the event that passenger service requirements would unreasonably impair freight operations. The likely scenario would be that the freight railroad would indicate that it is unable to provide the desired service performance on a busy corridor, even with passenger train dispatching priority, leading to a negotiation on what infrastructure and operations management improvements would be required. A freight railroad corridor that does not support an existing passenger service is unlikely to have both sufficient capacity and physical capability to support a high-quality passenger operation. This means in most cases that the passenger agency must fund infrastructure improvements.

In most cases, Amtrak intercity service operate over corridors owned by freight railroads, plus a few segments owned by commuter rail agencies. The principal exceptions are the NEC, major passenger terminals, and a segment of the Chicago to Detroit corridor. New Amtrak intercity services are likely to also be operated over infrastructure owned by other parties. In a few instances, where freight traffic is low and extensive infrastructure improvements are required, it may be more attractive for the passenger rail agency to acquire the corridor or adopt one of the other alternative approaches, as discussed in the commuter rail section below.

Commuter Rail. Commuter rail has no right of access and must negotiate at arm's length with the host railroad. Access will be provided at a cost to the commuter rail agency separate from sharing operating and maintenance costs. Without Amtrak's access rights, access costs can be high, prompting passenger rail agencies to seek alternative approaches. Several access models exist, depending on local circumstances, up to and including acquisition of the rail corridor from the prospective host.

Because grants are available for capital costs, commuter agencies almost always prefer the access payment to be in the form of a one-time capital investment rather than ongoing payments for train-miles operated. Approaches for securing access include the following options:

- **Access Existing Track.** The passenger rail agency can negotiate access to existing freight tracks, which on already busy routes may require added capacity and track and signal system upgrades. This approach makes the most sense where the corridor is a key link in a freight network and the owner will not consider a sale. It is also the approach commonly taken for intercity services, because the desired routes are less likely to be realistic purchase candidates and often carry substantial freight traffic. Within this general category, there are three approaches to ensuring that passenger service requirements can be met:
  - Pay a lump sum for a perpetual easement on a freight railroad corridor to operate a specified passenger rail service. The agreement specifies the number of trips, journey time, and schedules, but the railroad takes responsibility for selecting the infrastructure improvements needed to deliver the service. The Sounder service north from Seattle to Everett, Washington, took this approach.
  - Fund agreed-upon infrastructure improvements in the corridor to meet passenger service requirements. This approach is probably the most common where purchase of the line from the host freight railroad is not a realistic option.
  - Pay for access as an ongoing usage payment, based on train-miles operated. An example of this approach is the Sounder service from Seattle southward to Tacoma, Washington. This approach means that access must be paid for as an ongoing operating expense.

- **Expand Existing Arrangements.** If the project is for further development of an existing service, the usual approach is to expand on existing arrangements with the freight railroad and make whatever infrastructure investments necessary to provide the required capacity and facilities. However, intervening developments in both passenger and freight traffic may be such that the parties decide to negotiate a new agreement on a different basis. An example of this is the commuter rail service between Boston and Worcester, Massachusetts. When first established, this service operated over CSX Corporation (formerly Conrail) track between Framingham and Worcester. More recently, changing conditions, including service quality problems on CSX territory, the likelihood that a CSX intermodal terminal in Boston will be relocated, and a desire to increase passenger train frequencies, have led to proposals for MBTA, the operating agency, to acquire the right-of-way (ROW) with CSX continuing to provide freight service.
- **Purchase the Rail Corridor.** Provided the passenger volume is adequate (probably a minimum of eight to ten round trips per day for all services in the medium term) and it is not a key freight corridor, then it can make sense for the passenger agency to purchase the corridor. The freight railroad would continue to have access to the line for freight service. The advantage for the passenger operator is that access is guaranteed, and the advantages for the freight railroad are that it receives a substantial up-front payment for the corridor that can be invested elsewhere on its system. The availability of a corridor for purchase depends on how the freight railroad views the future use of the line. The Class 1 railroads are still active in mergers and spin-offs, purchasing regional railroads to extend their service territory and selling lines to concentrate their efforts on high-volume corridors.

  This approach has been widely used in the past, for example by Los Angeles Metrolink, and has generally been successful. An issue that has arisen is that the freight railroad may later want to operate more trains on the passenger-owned corridor than was expected at the time of the original agreement. It is important to be explicit regarding future freight access in the purchase negotiations. The agreement should spell out any limits on freight use (number of trains, time-of-day restrictions, etc.) and how a request to expand freight use beyond the agreed-upon limits should be managed and financed. A very recent example of a line purchase is a proposed agreement by Florida DOT in conjunction with the Central Florida Commuter Rail agency to purchase 61.5 miles of CSX's A-Line from De Land through Orlando to Kissimmee, Florida, for a proposed commuter service. The purchase agreement was accompanied by a related agreement to help CSX upgrade the parallel S-Line for diverted trains and establish a new intermodal terminal at Winter Haven between Orlando and Tampa.
- **Acquire Space on Existing Freight Railroad Rights-of-Way and Build Parallel Track.** Another approach is to purchase or lease space in the freight railroads ROW for an exclusive passenger track or tracks. This option is available where the ROW is wide enough and the freight railroad does not expect to need the space for additional sidings or running tracks. In the past, this option has been used most often for heavy rail transit service (such as in Atlanta, Georgia; Washington, D.C.; and more recently for commuter service in the Salt Lake City and Denver areas). Freight railroad concerns about accident liability have sometimes led to purchase conditions requiring high minimum lateral separation between passenger rail operations and active freight lines, or restrictions on the kinds of equipment that the passenger operation can use. These conditions sometimes make the parallel track option infeasible, especially if the agency is considering the use of non-FRA-compliant passenger equipment. Some corridors originally planned as a light rail transit service have been converted to conventional commuter rail using FRA-compliant vehicles to meet freight railroad purchase conditions. An example is the proposed Gold Line commuter service in Denver.

  Although the parallel track approach has mostly been applied to commuter rail or rail transit developments, it has also been proposed as a way of providing a higher-speed passenger track in a freight railroad corridor. Examples include the long-range plans for a third passenger-exclusive track over portions of the Cascade corridor in Washington State. The track would be

built and maintained to passenger rail standards and practices, for example, FRA Track Class 6 or higher, higher maximum superelevation on curves, and an FRA-acceptable PTC system for the planned speeds. With freight use limited to emergencies and maintenance activities, overall costs are expected to be much lower than for a mixed-traffic high-speed line. A similar approach has been suggested for portions of the planned Midwest high-speed network.

Unfortunately, commuter rail agencies do not have much leverage in access negotiations. A host freight railroad may take the position that existing freight capacity must be maintained, even during passenger service peak operations periods. As well as insisting on thorough analysis of capacity issues, as described in the following paragraphs and in Chapter 3, a commuter (and intercity) passenger rail agency can identify other agencies in its state that have dealings with the railroad to leverage existing relationships or develop a joint program, where appropriate. If all else fails, the agency could make use of non-binding mediation by the STB.

Infrastructure Improvements

Except where a passenger rail agency proposes to purchase an easement from the host railroad and will not be involved in infrastructure improvement details, the passenger rail agency, host railroad, and Amtrak (if intercity service) must reach agreement on infrastructure improvements needed to support each passenger service development stage. Every effort should be made to ensure the discussions focus on practical solutions to operating problems, supported by thorough and credible analysis. Objections by the host railroad are best countered by analysis to quantify the problem and identify solutions. In the case of Amtrak intercity service where there are disputes over the necessity of specific projects, if these issues cannot be resolved in negotiation, they can be taken to the National Arbitration Panel (NAP) or the STB for resolution. Chapter 3 provides details of capacity and train performance analyses that are used to support infrastructure improvement decisions. Some other points on infrastructure improvements are:

- The staged infrastructure investment plan must be designed to accommodate expected growth for the planned passenger service development. It may also be helpful to include expected freight growth in the analysis, if any, so that the parties are aware of potential freight-related investment needs and plans that coordinate shared investments to benefit both host and tenant.
- Beyond the initial investment for the first stage in passenger service development, there must be a process for regular reevaluation of the infrastructure investment plan to adjust as external circumstances change.
- While infrastructure investments will be required on most corridors in order to obtain desired service quality for a new passenger rail service, this may not always be the case. Much depends on the current use of the corridor. If the corridor already accommodates passenger service, then it may be possible to add further trips without investments. An example is the portion of the Boston, Massachusetts, to Portland, Maine, Downeaster service operated over MBTA commuter lines in Massachusetts. The five daily round trips were added to existing commuter and limited freight operations on these lines with no investments, although with some time-of-day limitations.
- The infrastructure investments must be tied explicitly to a specific passenger service frequency (planned number of trips) and performance level (scheduled trip time, average delay minutes, etc.). A staged program, where specific projects and the associated funding are tied to each frequency increment and/or journey time reduction in the master agreement, has worked well in the past. Absent this specificity, the passenger agency may fail to realize the expected benefits from its investments. On at least one occasion, a railroad accepted infrastructure funds that the funding agency expected would be used to support a specific service frequency without making an explicit agreement. The railroad then limited frequency at a lower level than the agency expected and required further investment to meet the original passenger service goal.

- Passenger station requirements raise a number of unique issues for infrastructure investments and train operations. The passenger agency will likely need to purchase or lease land from the host railroad for station buildings and parking areas. Stations will need vehicular and pedestrian access, which may involve crossing active tracks. For safety reasons, pedestrian crossings at grade are considered very hazardous and may not be permitted in some situations. Grade-separated pedestrian crossings are costly and raise Americans with Disabilities Act (ADA) accessibility issues. Another primary issue for shared operations is providing adequate physical clearance for freight operations, at the same time as meeting ADA requirements for boarding trains.

Some aspects of safety are likely to arise that can affect proposed passenger operations. Liability fears may cause a freight railroad host to restrict the use of non-FRA-compliant passenger equipment, even on parallel tracks and independent of FRA approvals. Operation of freight trains through passenger stations while passenger trains are loading may be restricted, depending on station layout, which can affect capacity. The FRA may impose conditions on some operations, especially those over 79 mph, relating to PTC capabilities, track-to-track separation, and roadway worker activities, etc. All these matters must be resolved and factored into operations analyses and infrastructure improvement plans.

2.4.3 Capital and Operations and Maintenance Costs

Most of the technical issues relating to estimating capital and operating costs and how they should be shared between the host railroad and the passenger service are discussed in Chapter 3. This section discusses how and where these estimates play into negotiations with the host railroad.

Capital Costs

Capital costs are for infrastructure improvements to add capacity to a rail corridor and to upgrade track and signal systems to support the desired passenger service performance. Earlier stages in the negotiation will have provided a list of projects needed for each passenger service development stage and to accommodate forecast freight traffic. Estimates of the cost of each project will likely be developed by the host railroad, because it will be the contractor for the work (see Sections 4.3.5 and 4.4.4 for Amtrak intercity and commuter service, respectively). The negotiations will center on the share of project costs, if any, to be contributed by the host railroad. Generally, the host railroad will be more willing to consider contributing a share of the investment cost if the proposed project provides tangible benefits to freight operations and is aligned with the host railroad's business and investment plans. It is harder to convince a host freight railroad to contribute if the benefits are limited and/or if the corridor is not a key link in its network. It may take the position that other investments have a higher priority.

In most cases, the passenger rail agency must contract directly with the host railroad for capital improvements to track signals and structures. Many railroads have labor agreements that restrict the use of non-railroad contractors for specific kinds of work, independent of the funding source. Also, on an active railroad, railroad managers must coordinate construction work with train operations. Even on projects for an intercity corridor, Amtrak is not normally involved with capital improvement projects unless it is the owner of the corridor.

Operations and Maintenance Costs

In the case of **Amtrak intercity service,** Amtrak has existing operating agreements with most railroads, which can be extended or adapted for a new corridor, depending on the circumstances at that time and place. The passenger rail agency is an interested party, as it will be compensating Amtrak for costs not covered by fare box receipts, but Amtrak and the host railroad are the principals in the negotiation. If Amtrak and the host railroad cannot agree, they can ask the NAP or

the STB to resolve the dispute. The host railroad is required to accommodate Amtrak intercity service at avoidable cost.

In the case of **commuter service,** the passenger agency will be expected to contribute its share of total O&M costs. Technical aspects of estimating total O&M costs and sharing these costs between multiple rail corridor users are discussed in Chapter 3. Generally the share of total costs is higher than the incremental increase of O&M costs when passenger service is added. This share is higher because a railroad incurs a number of costs as soon as it is put into service and before any trains run. Examples are basic inspection costs and the cost of vegetation control, which are unrelated to traffic level and traffic mix. These "fixed" costs are allocated between users on the basis of a corridor-use parameter such as train-miles or ton-miles, depending on which can be most closely linked to the cost.

2.5 The Liability Issue

Liability concerns can be a major barrier to the introduction of passenger rail services and one of the most difficult issues to resolve in negotiations. It is also a highly complex subject, where the nature and cost of liability coverage depends on the operator (Amtrak or another operator), state and federal laws that cap liability in different circumstances, and the type of host railroad. A short-line or regional railroad may have very different requirements than a Class 1 freight railroad with "deep pockets." The following is an outline discussion of liability issues. For a more in-depth analysis, the reader is referred to a U.S. Government Accountability Office (GAO) report (*Commuter Rail: Many Factors Influence Liability and Indemnity Provisions and Options Exist to Facilitate Negotiations. GAO-09-282, February 2009*). Most of the discussion in the following sections and in the GAO report is related to commuter rail operations. Amtrak has long-standing liability and indemnification arrangements with its host freight railroads and is also able to appeal to the STB to resolve disputes. Amtrak intercity services, therefore, face far fewer liability problems than a commuter operation.

Note that this Guidebook cannot offer legal advice or advocate policy changes to help commuter rail agencies with the liability issue. Agencies are strongly advised to retain knowledgeable legal support on this issue and to read the GAO report, which does contain some policy suggestions.

2.5.1 The National Liability Situation and Amtrak

Liability limitations for passenger rail operators under current law were enacted as part of the Amtrak Reform and Accountability Act (ARAA) of 1997. The ARAA limits the liability for personal injury to, or death of, a passenger or damage to a passenger's property. This provision, codified at 49 United States Code (U.S.C.) §28103, applies to any passenger rail operation, including all commuter operators and Amtrak, and is independent of corridor ownership. The statute limits the aggregate allowable awards to all passengers against all defendants for all claims arising from a single accident or incident up to $200 million. It also authorizes passenger rail service providers to enter into contracts to allocate financial responsibility for claims, and it mandates that Amtrak maintain minimum liability insurance coverage of $200 million. Finally, the statute contains limitations on punitive damages (clear and convincing evidence of gross negligence is required) and provides that any such damages shall be included within the $200 million maximum.

Note that the $200 million limit only applies to passengers and their property, not to railroad employees (to whom Federal Employers Liability Act provisions apply) or to injuries to third parties and other property losses arising from the accident.

However, this law is relatively new and has yet to be tested in the courts. Questions remain over the extent to which indemnification agreements can protect a freight railroad in a case of gross negligence and whether the $200 million limit would be upheld in such cases. For this reason, freight railroads are asking for liability insurance levels up to $500 million for some commuter rail operations.

Almost all Amtrak liability and insurance arrangements with host railroads are "no fault." In nearly all of these arrangements, Amtrak is responsible for damage to its property (such as passenger cars and locomotives) and injury or death of its employees, contractors, and passengers (including "meeters and greeters"), as well as grade crossing accidents involving its trains. The host railroad is responsible for harm to trespassers and its own employees and for any liability not expressly assumed by Amtrak. Generally, Amtrak compensates host railroads for this residual liability at a given rate per train-mile. Residual liability was one of the subjects that had to be resolved with Guilford Rail System prior to starting the Downeaster Boston, Massachusetts, to Portland, Maine, service. In the Guilford case, the STB pointed out that the rate offered by Amtrak was not deemed compensatory. However, most arrangements require the host railroad to assume this risk and accept the rate per train-mile offered by Amtrak.

2.5.2 Non-Amtrak Passenger Rail Service Operators and Agencies

Commuter rail services, whether operated under contract by Amtrak or not, have to make their own liability and insurance agreements with the host railroads, although they are covered by the 1997 ARAA liability limit. These agreements vary widely, depending on the type of host railroad, whether the operator is a state agency or contractor, and state law regarding liability limits. The GAO in *Commuter Rail* (GAO-09-282) provides a list of the basic provisions for commuter rail liability arrangements. In addition, many existing agreements were signed many years ago and may not be representative of what could be negotiated today. Given the huge variability, common themes are difficult to extract, but an overview is provided below. The overview divides the liability question into two areas: (1) the liability coverage required or typically provided and (2) how the coverage is secured and which entity takes on the financial responsibility for different types of loss.

Required Liability Coverage

The following points summarize what liability coverage is currently required or requested in negotiations for passenger service on freight railroad tracks, including variations where parties other than just a host and a single tenant are involved:

- Major freight railroads are asking for protection against any liability that would not be present "but for" the presence of passenger trains, even events where the freight railroad or its employees are shown to be grossly negligent. This means, for example, the freight railroad requires indemnification or insurance to cover all costs associated with a collision with a passenger train where the freight carrier was at fault, on the grounds that the collision would not have occurred "but for" the presence of the passenger train.
- Major freight railroads are also asking for up to $500 million in liability coverage per incident. This amount would cover the maximum $200 million for passenger injuries and losses required under ARAA, plus provide coverage for all other liabilities, such as property damage, environmental damage, service disruption, legal costs, injuries to railroad employees, contractors, and bystanders, etc. The additional coverage also protects against the possibility that the $200 million limit in ARAA is successfully challenged in court. Some passenger operators have been able to negotiate a lower liability limit with a freight railroad than the initially required $500 million per incident. However, many operators have a lower limit in current agreements and may be faced with higher demands when the agreements are renegotiated.

- Aside from the requirements of a freight railroad hosting a passenger service, liability and insurance questions have to be resolved among all the other parties involved in providing passenger rail service on a given rail corridor. Depending on local circumstances, interested parties can include a state DOT that sponsors a service, a commuter rail agency, and a contract operator (Amtrak, a freight railroad, or a private firm). Amtrak is frequently involved where Amtrak is either the infrastructure owner (as in the NEC), or the intercity service operator in the same corridor.
- Liability arrangements are required between two passenger rail agencies operating on the same corridor, as well as between the host railroad and each passenger operator. Where Amtrak hosts a commuter rail service, it typically requires the same "but for" liability protection as a freight railroad host. Amtrak's position is that under applicable law it cannot accept any additional liability due to the presence of another operator on its tracks, as it cannot incur any expenses that are not for qualifying intercity passenger rail service.

Arrangements Made to Obtain Coverage and Who Bears the Cost

As well as the $200 million limits for passenger injuries and property loss, the ARAA also gives passenger rail operators and agencies the power to enter into contracts that assign financial responsibility for liability costs. This provision was needed because of court decisions arising out of the serious collision in Chase, Maryland, in 1987. In this case, a court held that Amtrak's indemnification of the freight railroad against passenger-related losses (which were very large) could be set aside, on the grounds that the collision was caused by gross negligence of a freight railroad employee. This decision created great concern among freight railroads that they could not rely on indemnification agreements for passenger service. The 1997 law is intended to ensure that liability-related contractual agreements are enforceable.

Liability agreements between a passenger rail agency and a host freight railroad typically contain the following elements or consider the following issues:

- The passenger rail agency self insures for lower-consequence events, with a cap between $1 million and $20 million. The most common self-insured amounts range from $5 to $10 million per event.
- Each operator is responsible for events that involve only that operator's property and employees. For example, a collision involving only freight trains on freight railroad tracks would be wholly the freight railroad's responsibility.
- In many agreements, each operator is responsible for damage to its own equipment and injuries to its employees. However, in a number of cases, the passenger rail agency agrees either to compensate the host railroad for such losses in an accident involving a passenger train or to obtain insurance to cover such losses.
- Commercial insurance is purchased in layers from the self-insured limit up to between $100 and $200 million. The maximum is usually the liability limit agreed to with the host railroad in the access contract. Some passenger rail agencies have existing agreements where the freight railroad takes responsibility for a layer of the $200 million, for example between $10 and $85 million, regardless of fault. Such arrangements are not likely to survive renegotiation.
- In agreements that call for liability coverage exceeding $200 million, such as up to $500 million, insurance has to be obtained on the international market, for example from Lloyds of London.
- It is important to avoid, as much as possible, agreements where liability depends on establishing the degree of fault to be borne by each party in individual accidents, which can lead to lengthy legal proceedings. In practice, almost all agreements are "no fault."
- The passenger rail agency must protect the passenger service contract operator from liability, whether the operator is Amtrak or a private firm.

- It is important to ensure that insurance arrangements fully cover "passenger-on-passenger" events where two passenger operators share a corridor, whether the infrastructure is owned by a passenger operator or a freight railroad.
- Many states have provisions in their constitutions or laws that prohibit state agencies from accepting liability for punitive damages and/or accepting liability for incidents where the host railroad is grossly negligent. Such provisions can be a major barrier to successful access negotiations when the host railroad requires exactly this coverage. Even where there are no legal or constitutional barriers, state governments and legislators often feel that accepting liability is highly inappropriate in cases of gross negligence by the host railroad. The following approaches can prevent liability issues from becoming deal breakers:
  - Set up an independent authority to manage the rail service that is structured so that constitutional or legal barriers do not apply. An example of this approach is the NNEPRA, an independent agency in Maine that oversees the Downeaster service. See Case Studies 3.
  - Where there are no constitutional or legal barriers, focus on getting the deal done, even if it requires agreeing with some unappealing provisions. The railroad's insistence on "but for" protection is not unreasonable from its point of view, and a calm explanation may help defuse objections by elected and appointed officials.
  - Retain experienced legal counsel that can advise on these complex and specialized issues.

Even when all legal issues have been successfully resolved, the insurance cost can be a major barrier to implementing a new commuter rail service. This situation is especially true for a small-scale new start by a passenger rail agency that has no previous record of safe operations. The GAO report cited previously says that insurance costs can comprise more than 20 percent of operating costs for such an agency. There is no easy solution to this problem at present, and the agency is advised to retain experienced legal counsel, contact other agencies for their insurance experience, establish a robust safety program for the operation, and engage a very experienced contract operator with a good safety record.

CASE STUDIES 3

The Northern New England Passenger Rail Authority

When the development of plans for Boston, Massachusetts, to Portland, Maine, passenger rail service reached the point of starting negotiations with host railroads and Amtrak to implement the service, officials in the Maine government realized it would be difficult or impossible for Maine DOT to enter into the agreements required, most notably for liability coverage and for contracting for ROW improvements with the host railroad. NNEPRA was created as an independent agency with a separate chair, board of directors (mostly business people but with Maine DOT representation), and an executive director. It holds the contract for train operations with Amtrak, contracts with the host railroad for capital improvement projects, and contracts with other providers of goods and services (for example, on-board food service). NNEPRA is also able to apply for grants and loans to fund the service and service improvements, as well as receive appropriations from Maine DOT.

CHAPTER 3

Analysis and Modeling

3.1 Introduction

Negotiating access to a rail corridor for a new or expanded passenger rail service often raises highly technical questions about rail line capacity, the extent and nature of capacity investments required, providing service reliability and planned journey times, estimating capital and operating costs, and determining how costs should be divided between multiple rail corridor users. In corridors with relatively simple operations, these questions can be answered by manual analysis (for example, using string charts) or exercising simple train performance models. However, in corridors with complex operations, either high-density traffic or operations with many long-distance and unscheduled freight trains, these questions cannot be answered by simple analyses or using a negotiator's personal experience. Instead, the negotiators need to rely on detailed analyses using the different kinds of models to resolve these questions. Modeling methods and model inputs must be acceptable to all parties to ensure that the results are trusted and can be used to guide the parties toward an agreement. It is generally not productive for each party in the negotiation to perform its own analysis and compare results. Experience has shown that the results from different models are rarely identical. They can differ enough to cause disputes about the validity of the models for the specific situation being analyzed—the unproductive "dueling models" situation. This situation can add to negotiating difficulties rather than guide the parties toward a mutually acceptable agreement.

The specific areas where detailed analysis and modeling may be used include:

- Operations simulation and capacity analysis.
- Capital cost estimating and cost sharing.
- Operating costs and cost sharing
  - Amtrak avoidable-cost methodology.
  - Fully allocated costs for commuter rail.

The following sections discuss analysis and modeling techniques used for passenger projects and how they have been applied.

3.2 Operations Simulation and Capacity Modeling

3.2.1 Simulation and Modeling Overview

Except for the simplest of operations, there is no easy formula that will yield the capacity of a rail corridor. There are simply too many variables involved (train characteristics, speed limits, train and siding lengths, signal system characteristics, etc.) for any simple approach to yield useful results. Because of this level of complexity, all methods of operations simulation and capacity analysis rely on detailed operations simulation methods.

Simple Models

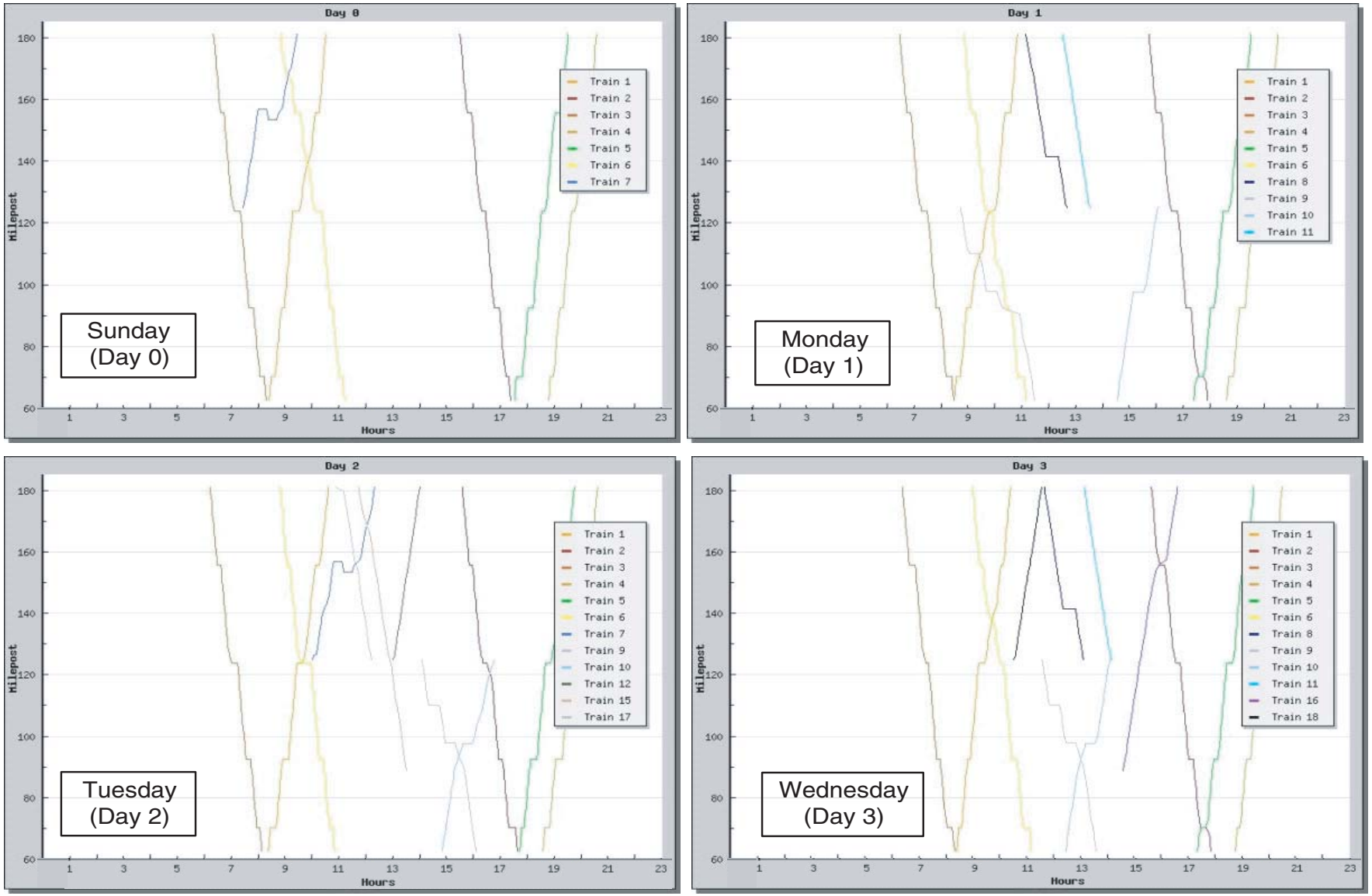
In its simplest form, a simulation model is a computer program that performs a stepwise calculation of the movement of a train over a rail corridor. Using information on speed limits, grades, train acceleration and braking rates, station stop dwell times, etc., the model calculates the speed and distance traveled by the train for each time step (e.g., every 10 seconds). After the model has stepped along the whole corridor, it produces a tabulation of time and distance traveled, often presented graphically as a time vs. distance string-line chart. A model that performs this calculation for a single train moving over a rail corridor is usually known as a Train Performance Calculator (TPC), because it calculates travel time without interference from other trains operating on the corridor at the same time. TPCs often have additional features, such as an ability to calculate energy used or fuel consumption. Single-train TPC calculations are used to determine what rail corridor upgrades will be required and to provide the desired travel time before the interference effects from other trains and other typical operating delays are taken into account. For initial planning, it is customary to pad the minimum trip time by around 10 percent to estimate a practical trip time. This type of calculation can be used to investigate such questions as the reduction in journey time from increasing top speed from 79 mph to 110 mph, or adding or omitting station stops.

Complex Models

The more complex version of a train operations simulator performs a simultaneous calculation of all train movements on the corridor, taking into account signal system characteristics, train priorities, temporary slow orders, and typical dispatcher decisions over where trains should meet or overtake each other. At their most complex, the multi-train simulations closely reproduce how a real rail corridor would be operated, taking into account all the variations in individual train performance and other operating constraints and variations. Results are usually presented as the calculated trip time for each train compared with minimum time with no interference from other trains, slow orders, etc. The difference is reported as a delay. Operation over the corridor can also be represented on a string-line chart (see Figure 3-1) or as an on-screen animation—a speeded-up version of a dispatcher's display.

However, a single run of a corridor operations simulation will only represent operations under one set of input conditions. Railroad operations are subject to a variety of random and planned disruptions to normal operation, including planned and unplanned track maintenance, delays at stations, and delays caused by events elsewhere on the railroad. Freight train operations are not normally conducted with great precision, and even scheduled freight trains are subject to variability. In addition, many through freight trains are unscheduled "extras" that run as needed and may enter the corridor at any time. Multiple model runs are used to address these variables, with results presented as average run times and delay statistics for each train, along with string charts and animations as required.

The primary use of a multi-train simulation model is to investigate which infrastructure upgrades to an existing rail corridor are needed to enable it to accommodate additional passenger train trips while still meeting specified service performance requirements (train departure times, trip time, and on-time performance) and complying with any other specified constraints. The analyst will start with improvements identified using a single-train TPC (if available) and will make multiple model runs to test alternative track configurations and other improvements. The objective is to identify a cost-effective package of improvements that will meet the service requirements of all users. Given the trial-and-error process of using simulation models, the complexity of these models, and the potentially large number of alternative corridor configurations to be investigated, an experienced modeling analyst is essential. Modeling is something of an art, and a model cannot represent everything about a route. Interpreting results requires judgment,



Note: Trains 1-6 are passenger and the remainder are freight.
Source: UVA IDOT Base Case report for the FRA

Figure 3-1. String charts for different days of the week on a segment of the Chicago to St. Louis corridor.

informed by experience using the model, experience with interpreting the results, and experience observing real-life outcomes.

3.2.2 Choice and Availability of Models

This discussion focuses on appropriate models to support detailed negotiations with a host railroad to operate passenger train service over a busy rail corridor. The model used must be able to take into account all operating constraints and corridor features and must be accepted as producing valid results by all parties in the negotiation. Simpler or alternative models are often used during earlier planning stages and for corridors with less complex operations.

In many cases, these requirements limit the choice to two comprehensive rail operations simulation software packages that are widely used in the railroad industry for capacity evaluation and project and service planning. These packages have been used in almost all recent passenger rail service developments where corridor operations were sufficiently complex to warrant the use of detailed modeling.

Some agencies may be uncomfortable with the apparently restricted choice of simulation software for capacity analysis and will point out that other models exist and have been used successfully in the past. Although this is true, the firms responsible for the two leading software packages have continually refined their products, added new features, and built a broad user base among passenger and freight railroads. These efforts have given the models an industry-leading position, overtaking the competitors. In addition and most important, many passenger and freight railroads have invested considerable resources in assembling rail network infrastructure and operations data for use with their chosen package. It is costly and time consuming to re-input these data for use with another package, even if one were available and would be acceptable to all parties. The advantage of using one of the leading simulation models is that the results are highly realistic and are likely to be accepted as such by all parties. The long history of successful applications of the models to different corridors means that most potential "bugs" have been found and corrected, so the parties are very unlikely to encounter surprises when the new service starts operation. For these reasons, usually the most practical option regarding model choice will be to use the train operations software package routinely used by the host railroad to analyze operations on the corridor.

The two packages are Rail Traffic Controller (RTC) developed by Berkeley Simulation Software and RAILSIM developed by the rail consulting firm SYSTRA. RTC is specifically designed for application to North American freight railroads, with substantial unscheduled train movements and a range of signaling and train control methods. RAILSIM is most commonly applied to higher-density passenger rail and rail transit corridors and contains modules for modeling passenger car fleet utilization and other service design aids. In spite of this specialization, either package can be applied successfully to passenger-dominant or freight-dominant shared corridors.

The rail operations simulation models used by both packages are data-intensive and relatively costly to use. They require detailed information on track layout, speed limits, signal systems (including signal block lengths), and full details regarding the rail traffic operated. This detail includes data for each train or type of train operated, including locomotive or traction power and braking characteristics. The large amount of data needed, however, make these packages cumbersome and not well suited for use in earlier-stage planning studies or for the rapid screening of multiple alternatives. Simpler models have been developed for this purpose, such as the Association of American Railroads Train Energy Model (TEM), a train performance calculator particularly designed to evaluate the effects of route characteristics and operating techniques on trip time and energy consumption. Also, several commercial consulting firms, such as Parsons Brinckerhoff and Zeta-Tech, have developed screening-level models for capacity and train performance analysis.

Rail Traffic Controller Software Package

RTC simulates train movements over a rail corridor by mimicking the behavior of a skilled dispatcher, given rail traffic volume and mix, track layout, signal system, etc. A TPC module calculates train progress over the corridor in response to signal indications and dispatcher commands. Results of each model run are presented as traffic flow animations, time-distance (string-line) charts, train delay statistics (the primary measure of whether capacity is adequate), TPC outputs, and various train operating statistics, such as average speed (velocity). The model can be used to evaluate the sensitivity of corridor performance to traffic level and mix, evaluate benefits from capital improvements, design a train schedule, and identify bottlenecks or capacity constraints and options for removing them. Almost all the U.S. Class 1 railroads have standardized on RTC and have prepared infrastructure and operations data for entry into RTC for much of their route network. The principal advantage of the RTC package for freight railroads is that it is specifically designed for North American freight operations and fully accounts for the characteristics of such operations. It has been adapted to user experience to make it the leader for U.S.-style freight operations.

RAILSIM Software Package

RAILSIM is the second widely used software package for train operations simulation. Applications of this software have mainly been to higher-density and complex commuter and rail transit operations, to plan optimum track and signal system layouts, and to minimize delay potential and energy consumption. RAILSIM was recently used to plan Caltrain commuter service developments between San Francisco and San Jose, California, a predominantly passenger corridor with limited local freight service. It is also widely used in the New York City region on predominately commuter corridors, such as the Long Island Railroad, Metro-North Commuter Railroad, and New Jersey Transit, and in the Chicago area by Chicago Metropolitan Rail (METRA) and Northern Indiana Commuter Transportation District (NICTD).

3.2.3 Using Simulation and Modeling in Rail Corridor Planning and Negotiations

The recommended approach to applying rail operations simulation, analyzing the capacity of a shared corridor, and determining the infrastructure investments needed to provide a defined freight and passenger service is discussed in the following subsections.

Step 1. Agree on What Type of Analysis is Required and What Model to Use

The first step in any operations simulation modeling is to agree on what kind of analysis is required and what simulation package will be used. The kind of analysis will depend on the complexity of operations on the corridor. A corridor with simple operations—such as four or five daily passenger round trips, a daily local freight train, and three or four through freight trains that run to a predictable schedule—should not need complex modeling. Instead, a simple train performance calculation and string-line time-distance plots should be sufficient to plan passing siding locations and where track upgrades to increase speeds are worthwhile. A corridor with more trains, trains with different priorities, and long-distance through trains with unpredictable schedules will require more advanced analysis.

As indicated earlier, it will be most cost and time effective to use the train operations software package routinely used by the host railroad to analyze operations on the corridor. The freight railroad will likely already have prepared train and infrastructure data for the model, greatly reducing the effort needed to prepare for analysis. Almost all Class 1 freight railroads have standardized on the RTC model, so it is highly likely that the best choice for capacity and infrastructure investment analysis for a new passenger rail service on a busy Class 1 rail corridor will be the

RTC package. Stakeholders report that freight railroads consider RTC to give the most reliable capacity analysis available and are very reluctant to accept results from alternative models as a basis for estimating capacity requirements of a proposed passenger service. Passenger rail agencies that have participated in RTC-based capacity analysis report that they have been satisfied with the results and the resulting decisions regarding the need for capacity investments.

The situation will be similar on a busy commuter rail corridor (often used by an intercity passenger service for final miles into a city center), except that the software package of choice is more likely to be RAILSIM. Smaller host railroads (for example, a non-Class 1 freight rail or a smaller commuter operation) will likely not have previously conducted detailed operations simulation analyses; if detailed analysis is necessary, the parties are more free to choose among the available analysis packages.

In all cases, this Guidebook strongly recommends that a single series of capacity and infrastructure analyses are performed using the selected analysis package. Both host and tenant should collaborate on specifying analysis inputs and in reviewing and interpreting results.

Step 2. Identify Passenger Rail Agency Analysis Team and Agree on Modeling Procedures

The passenger rail agency must enter discussions with a host railroad on capacity and infrastructure investments with adequate technical support. Most important, the agency's team must include an individual with experience with the specific operations simulation software selected for capacity analysis. In many cases, the analysis will be carried out using the host railroad's software and corridor infrastructure input data. To ensure the passenger rail agency's interests are fully represented in the negotiations, model inputs and results must be subject to a knowledgeable independent review.

When implementing passenger service on a major freight railroad, the most widely recommended approach to performing evaluations of a proposed passenger service is for the railroad and passenger rail agency to agree that one party (the freight railroad, the passenger rail agency, or a mutually acceptable consultant) will perform the analysis and share inputs and results with both parties. According to reports, some railroads have insisted on doing the calculations themselves and have been reluctant to share some details of inputs and results. This reluctance may be because of concern about revealing confidential business information or caution about getting involved in a lengthy dispute about the validity of input assumptions or interpretation of results. However, as confidence has grown in cooperative analysis and with the use of confidentiality agreements, these concerns have faded. Stakeholders report that the modeling process is becoming much more open.

Step 3. Agree on Key Rail Service Inputs

Once the analysis package has been selected, the next step is to define the passenger and freight rail services that will operate over the corridor. The typical data needed are discussed in the following paragraphs.

Passenger Service. The service data needed for either intercity or commuter service or both will include:

- Target trip time, with station stops as planned. Both trip time without delays and a practical schedule time with an allowance or padding for delays should be defined. Adding excessive padding (such as exceeding 5 minutes per hour) to cover for poor operations or maintenance procedures should be avoided.
- Station locations and expected station stop dwell times.
- Train departure times and the number of daily trips in each direction.
- Service quality parameters, primarily OTP at final and intermediate stations, and fraction of trips missed due to equipment or infrastructure problems.

If the service is to be developed in stages, this information is required for each development stage.

Freight Service. The service data needed for freight service includes the numbers and types of trains forecast to move over the corridor corresponding to each passenger service development stage. Numbers of trains will be based on the railroads' business plans and economic forecasts. Arrival times of trains approaching the corridor should be based on the freight railroad's operations plans, with a measure of the variability of arrival times. Some trains will follow predictable schedules, for example, intermodal trains and regular local freight trains, while some may be seasonal, such as grain trains that run during harvest seasons. Some trains will run completely at random. Day-of-week variations are also typical in freight service. It is advisable for the passenger rail agency to review the freight traffic forecasts independently, and raise questions if these appear to be inconsistent with state rail plans, likely local and national economic conditions, and announced plans to change freight train routing.

Step 4. Carry out the Analyses

The analyses will be tailored to each specific passenger rail situation. However, a typical set of analysis sequences might include:

- TPC-only analysis for passenger train trips to establish minimum track upgrades and speed increases to achieve the desired trip time, after allowing for reasonable schedule pad.
- Analyses of present-day freight and passenger (if any) operations on the corridor to check that the analysis adequately represents the real world and also to establish a baseline for the current performance of trains using the corridor. In particular, current delay statistics on the corridor will set a target for corridor operations with added passenger trains.
- Further sets of simulations analyses with corridor speed upgrades determined using the TPC, and various capacity investments (double track, passing sidings, train control systems) to identify improvements that meet both capacity and performance goals. Delay statistics are the primary measure of performance; the corridor must maintain at least present freight train performance levels while meeting passenger train targets. This analysis is repeated for each stage in passenger service development if a multi-stage program is planned.
- Joint review of each analysis by the passenger rail agency and the host railroad, and discussion and resolution of any questions.

Case Studies 4 provides an example of ongoing use of simulation modeling (in this case using RTC models) by the Capitol Corridor Joint Powers Authority (CCJPA) in California to manage track and service improvements on this corridor.

CASE STUDIES 4

Application of the Rail Traffic Control Model and Capital Planning

The CCJPA and its host railroad, the Union Pacific (UP), make extensive use of the RTC model for ongoing planning of capital investments. Full details of the route and passenger and freight services are coded into the model. CCJPA develops a long-term "Vision Plan" for the corridor and communicates this to UP. UP then runs the RTC model and develops plans for investments needed to accommodate each increment of passenger rail service, especially identifying bottlenecks that would constrain future freight service growth and journey time reductions. UP also develops cost estimates for the proposed improvements so that, after review and negotiations, CCJPA can issue a work order under the master agreement to execute the work as funding becomes available.

3.3 Capital Investment Planning, Costing, and Cost Sharing

Almost all proposals for new or expanded passenger service require capital investment in infrastructure along the route, either to improve the quality of the infrastructure, to support the proposed passenger service, or to add needed capacity. The steps in this investment process are first to determine what is needed to support the proposed passenger service, then to estimate the capital cost of the required projects, and finally to determine how these costs will be shared between the freight railroad and the passenger rail agency. The details of a capital project also have significant implications for ongoing maintenance costs. Adding a passing siding means that maintenance cost will increase. Rebuilding deteriorated track structure with new rails, ties, and ballast will reduce ongoing maintenance costs for a period of time.

3.3.1 Right-of-Way Access or Acquisition

The different approaches to gaining access to a rail corridor for a new or expanded passenger rail service are discussed in Section 2.4.2. This section discusses methods to place a price on gaining access and to estimate the cost of completing corridor upgrades to support the planned passenger rail service. The factors to consider in estimating costs and prices are discussed in the following subsections.

Amtrak Intercity Service

Amtrak's right of access means that it can make use of existing available capacity on a rail corridor at no cost and is only obligated to pay incremental costs for use of a host railroad's tracks. However, in many cases, the existing infrastructure is not adequate for a planned service, either because track condition and signal system capabilities will not support planned train speeds and/or because there is insufficient capacity to accommodate planned passenger and freight operations. The need for additional capacity should be based on objective analyses as described in Section 3.2, to ensure that the corridor is able to accommodate planned and forecast passenger and freight services with planned investment. If necessary, a passenger rail agency will need to negotiate funding for track and signal system improvements and additional line capacity needed for passenger service. The host railroad would be responsible for any investment that it would have needed to accommodate forecast traffic, if the passenger service had not been implemented. The process for estimating capital costs of track and signal system improvements and additions, and shares of cost to be borne by host and tenant are discussed in separate sections.

In a few instances, it may be attractive for the passenger rail agency to purchase a rail corridor or part of a rail corridor, usually where freight traffic is very low and there is a willing seller. This approach has not been used in the past—opportunities were few and funds were lacking. However, outside the NEC, Amtrak does operate over portions of several commuter networks, owns a segment of the Chicago to Detroit corridor, and operates a corridor in North Carolina owned by the state.

Commuter Service

Commuter rail agencies do not have Amtrak's right of access to the rail network and therefore must expect to incur a cost for access to a rail corridor that is separate from capital expenses for infrastructure improvement and a share of operations and maintenance costs. The different approaches used by passenger rail agencies and their cost implications include:

Purchase the Rail Corridor. This option is commonly selected for commuter rail, where the corridor was a low-traffic freight branch line prior to introducing a new service. The value of a corridor as a freight rail business or the value of railroad materials installed in the corridor is gen-

erally quite low, and the sale price is primarily a function of the corridor's real estate value. This value depends on many local factors and would be beyond the scope of this Guidebook to suggest methodologies to estimate a fair purchase price. In most cases, the track and signal systems (if any) have to be completely replaced. The rail freight operator usually is given permanent access to the corridor to provide ongoing service, subject to time-of-day restrictions so that freight operations do not interfere with the proposed passenger operation.

Directly Fund Infrastructure Improvements. Commuter rail agencies can directly fund infrastructure improvements sufficient to provide the capacity consumed by the passenger rail service, plus any signaling and track quality improvements required for passenger service. This approach would be used where the host railroad is willing to accommodate the passenger service but requires that existing capacity for freight operations is preserved, including maintaining spare capacity for future freight growth. A freight railroad may also require that capacity is maintained at specific times of day, depending on the type of freight traffic using the corridor. In other instances, the commuter and freight railroads have agreed on a combined package of investments, with costs shared, to serve passenger service requirement as well as anticipated freight traffic growth. Every case is different and must be worked out in negotiations. There are several examples of this approach, such as improvements on Norfolk Southern Railway and CSX in Northern Virginia for the Virginia Railway Express (VRE) commuter services into Washington, D.C. Often the improvements are not a one-time investment but are a series of projects implemented as required by passenger and freight traffic growth.

Purchase a Permanent Easement. A permanent easement can be purchased for a specified commuter rail service (number of trips, schedule, journey time, etc.). This option has two sub-options:

- Acquire an easement to construct a separate commuter rail line parallel to a freight line within the existing railroad ROW. This option is selected when it is not technically feasible or is very difficult for the commuter rail service to share track with the freight operation, and lateral space exists within the existing ROW. The commuter rail agency is responsible for constructing the commuter tracks, signal systems, stations, etc. This option has been used for the Gold commuter rail line in Denver and the Front Runner service north from Salt Lake City. As with outright purchase of a rail corridor, price will depend on local circumstances.
- Purchase a permanent easement to operate commuter rail service on the tracks of the host railroad for a lump sum. The easement seller guarantees access for a specified number of passenger rail trips to specified schedules and trip times and is responsible for making infrastructure investments to honor this agreement. This option bundles the cost of access with the cost of infrastructure improvement. Because of the bundling, and the permanence of the agreement, it may be difficult to compare the lump sum payment with alternative estimates of access and infrastructure improvement costs, and to justify the payment to funding agencies. The primary example of this approach is the Sounder commuter service northward from Seattle.

As well as these two sub-options, access and infrastructure improvement costs can be converted into a per-train-mile usage cost to be paid as incurred. This approach was used for the Sounder service between Seattle and Tacoma in Washington State. Hybrid arrangements are also possible, using some mix of public funding of infrastructure improvements, a one-time capital payment, and ongoing per-mile charges.

3.3.2 Estimating Capital Costs

The majority of corridor access arrangements, whether for Amtrak intercity or commuter service, place the responsibility for funding and implementing corridor infrastructure improvements on the passenger rail agency developing the service. It is assumed that the passenger rail

agency and the host railroad will have performed capacity analyses as described in Section 3.2 and have determined what improvements are required to accommodate the planned passenger service as well as freight traffic growth. The improvement plans will reflect:

- Service quality and performance requirements for both passenger and freight operations.
- Improvements in track quality to meet requirements for planned passenger train speeds.
- Signal and train control system investments to comply with regulatory requirements, especially a PTC system suitable for planned speeds and able to provide the required line capacity. Some forms of PTC may not meet regulatory requirements for operations over 79 mph and also may reduce rather than increase capacity.
- Investments to increase capacity, such as adding or lengthening passing sidings, adding a second track, or changing signal block spacing.
- Any more detailed factors that affect capacity, such as a need to provide capacity for specified freight operations during passenger service peak period or to maintain total daily freight capacity while restricting freight train movements through commuter stations during peak travel hours for safety reasons.
- Investments in passenger station infrastructure, including purchasing or leasing land for the station and constructing the station. In many cases, a station will host multiple public transportation services to serve as a transportation hub. In such cases, station design and cost sharing will have to be worked out with other agencies sharing the facility.

Once physical requirements have been defined, the next step is to estimate the cost of implementing the improvements and to plan the construction work. Activities and responsibilities of this step will depend on whether the construction is on a corridor that has been purchased or leased by the passenger rail agency or is on an active host freight railroad.

On a corridor owned by the passenger rail agency, the agency can retain an engineering firm to prepare detail designs for the improvements, estimate costs, and select an experienced contractor to perform the construction work. The contractor and the agency will have to work with any tenant freight railroad to schedule construction work so that rail freight service can continue. Cost estimates must take into account the impact of accommodating ongoing freight and passenger operations, where applicable.

On a corridor owned by an active freight railroad, the host freight railroad will develop a cost estimate (taking into account the need to work around ongoing freight operations) and manage construction under a contract with the passenger rail agency. A freight railroad may retain an experienced engineering firm to do the cost estimates and design work, depending on the workload in the railroad's engineering departments and the nature of the work. Similarly, the railroad will determine whether to use contractors or its engineering department employees and equipment for the construction or upgrading work. Railroad union agreements often govern the conditions under which contractors may be used. As the source of funding for these projects, the passenger rail agency must review the railroad's cost estimates for reasonableness and properly inspect completed work before releasing payments.

3.3.3 Sharing Infrastructure Capital Costs

Many passenger rail agencies understand that a host railroad will obtain some benefits from infrastructure improvements to accommodate a proposed passenger rail service. Because there are identifiable benefits for the host railroad from these investments, passenger rail agencies believe that the freight railroad should contribute funds toward to the cost. There are two situations where cost sharing will be on the table in negotiations:

- Where investment in the corridor is already under consideration in the railroads planning. For example, a railroad may plan to replace an older automatic block signal (ABS) system with

Centralized Traffic Control (CTC) and replace manual siding switches with powered switches controlled from the central office, but the project is not sufficiently beneficial or urgent for the railroad to implement on its own. A contribution from the passenger rail agency will reduce the total cost to the railroad, enabling the project to go ahead under a cost-sharing agreement.

- Where the proposed passenger corridor is not an investment priority for the freight railroad, but the freight railroad will receive identifiable benefits from passenger-related investments. Stakeholders in passenger rail agencies often express the view that the freight railroad should share in the cost of these improvements, because it will receive benefits in the form of higher speeds, fewer delays, quicker trip times, etc. The benefits can be estimated using the results from capacity modeling. However, it can be difficult to reach an agreement on whether these benefits have any value to the freight railroad and, if so, how to determine the value.

The difficulty derives from how a freight railroad, or indeed any private business, approaches capital planning. At the beginning of its fiscal year, a railroad will estimate the capital expenditure it can afford in the year based on estimated earnings, borrowing costs, and related factors. Some investments will be to support long-term strategies established by the railroads' top management; some will support previous commitments, such as a contract to purchase a number of new locomotives that year; and others will be selected from among candidate projects submitted by the railroad's operating, engineering, and mechanical departments. In the latter case, projects will be ranked by return on investment (ROI), and the railroad will fund those with the highest ROI, up to the total of available funds. Projects that do not make the ROI cut will not be funded. It is unlikely that a railroad will be willing to contribute to a passenger service–driven investment if that project would not otherwise qualify for an investment, given the railroad's priorities and the current ROI hurdle rate. Alternatively, a freight railroad might be willing to contribute, provided the corridor is an important link in its network and the benefits relative to the investment meet the railroad's ROI and other investment criteria.

The best approach to reaching agreement on capital cost sharing is to discuss at the beginning of the capacity analysis what the railroads investment service needs on the corridor might be and seek to structure the project to meet both freight and passenger service needs. If the corridor is part of the railroad's core network, then the freight railroad would likely be willing to contribute at a level where the benefits yield an adequate ROI. If the corridor is not a priority for the freight railroad, then the passenger agency will likely have to fully fund the improvement project.

Another cost-sharing possibility occurs where a state agency is able to contribute funds from freight rail and grade crossing safety improvement programs. This was the case in Washington State on portions of the Portland, Oregon, to Seattle, Washington, and Sounder commuter service lines. Even if the state is able to provide funds from a freight rail program, the investment in the corridor must still be of value to the rail freight business and more broadly contribute to state freight transportation and economic development objectives.

3.3.4 Rolling Stock Capital Costs

Any new service has to provide for equipment (passenger cars and locomotives) to operate the service. There is no one best or recommended approach—use whatever meets objectives for the specific corridor and service at the time the equipment is needed. A summary of the approaches to providing equipment and the implications for capital costs follows:

- **Amtrak Intercity Service**
  - ***Purchase new equipment***. In this case, a competent railroad rolling stock consultant can develop specifications for the trains and develop a cost estimate based on recent prices paid to suppliers of similar equipment.

  - ***Lease new equipment.*** This approach converts the capital costs into a periodic payment, which becomes part of ongoing expenses. Whether leasing is attractive to a public agency depends on how accounting practices and funding arrangements treat capital leases. Discussion of the financial implications of leasing is beyond the scope of this Guidebook. In some cases, a capital lease may be bundled with equipment maintenance services.
  - ***Fund rehabilitation of existing out-of-service cars in Amtrak's fleet.*** In recent times, Amtrak owned a substantial number of out-of-service cars, which it could not afford to repair. Funding repair gives the passenger rail agency assured availability of cars for a proposed service at reduced cost. Exact terms of an agreement have to be worked out with Amtrak and would depend on the details of the rehabilitation project and the expected remaining service life of the cars.
  - ***Use Amtrak-provided cars,*** the cost of which will be included with Amtrak's charges for train operations and equipment maintenance for the proposed service. In recent years, Amtrak has lacked funds to purchase new cars or to rehabilitate more than a minimum number of out-of-service cars. This meant Amtrak was unable to provide cars for new intercity services, and passenger rail agencies had to adopt one of the previously mentioned alternatives. Since PRIIA (2008) and ARRA (2009), however, Amtrak is pressing ahead with plans to specify and acquire new cars both to replace life-expired equipment and build its fleet to support new services.
- **Commuter Service**
  - ***Purchase new equipment*** as previously described for intercity service.
  - ***Lease new equipment*** as previously described for intercity service.
  - ***Acquire existing commuter equipment suitable for the proposed service,*** by outright purchase, long-term capital lease, or short-term lease of temporarily surplus cars from another commuter rail agency. An example of a short-term lease was the temporary use of Sound Transit Bombardier cars by VRE and Los Angeles Metrolink until increases in demand and service frequency in Seattle required their return.

As well as selecting equipment for a specific service and developing a process for obtaining suitable equipment, the passenger rail agency has to determine the number of cars required. Fleet planning can be a simple manual process for smaller passenger services, usually involving calculating trip and terminal turn-around times and designing a schedule for a few train sets. For example, the New England Downeaster service is operated with only two train sets. For more complex operations, a computer simulation can help optimize fleet operations. For example, SYSTRA's RAILSIM package has a module that provides this capability. There can be substantial cost leverage in good fleet planning. For example, it was possible to add service frequencies on California's Capitol Corridor without adding train sets by reducing layover and turn-around times and rescheduling some trips. Similarly, the proposals to extend the Downeaster service to Brunswick, Maine, can be managed without adding train sets by using layover time in Portland, Maine.

3.3.5 Signaling and Train Control Capital Costs

Issues related to train control systems should be resolved in capital planning and, in the future, will inevitably be centered around meeting PTC requirements in the RSIA. New advanced technology PTC systems have been an area of research interest in the railroad industry for over 20 years. The primary function of PTC is to enforce safe speeds at all times to prevent collisions, overspeed events, travel over misaligned switches, and intrusion into work zones. More advanced versions of PTC may also provide capacity benefits from moving block train spacing, more precise speed control, and location management.

The RSIA requires PTC installation by 2015 on most freight main lines used for passenger service and/or for conveying certain hazardous materials. The same legislation required the railroad industry, in consultation with the FRA, to develop PTC interoperability standards. Since then, both the railroad industry and the FRA have been actively making plans to implement the legislation, but many of the details are still to be determined. Further discussion of the issues relating to PTC implementation since the October 2008 legislation and FRA safety regulations are provided in Appendices B and C.

Even though the details of PTC as applied to the U.S. rail system are still to be worked out, passenger rail operators outside the NEC area will clearly be affected:

- With few exceptions, locomotives and multiple-unit driving cabs will have to be equipped with PTC equipment that conforms to national interoperability standards. Each passenger service operator will be responsible for the costs of equipping its own rolling stock.
- Passenger rail agencies may have to bear all or part of the costs of wayside PTC apparatus on routes used by their trains. The actual shares will depend on whether the PTC is needed anyway because of corridor use for specified hazardous materials, corridor ownership, and whether the passenger service is Amtrak intercity or commuter. Cost-sharing arrangements will have to be negotiated among users, and it is possible that the STB will become involved in resolving disputes in this area and establishing cost-sharing principles.

It is not clear at this point whether a "basic" PTC system installed in response to RSIA requirements for a hazardous materials corridor will also allow passenger trains to operate at speeds exceeding 79 mph, or whether additional requirements will be imposed above 79 mph or at higher speed thresholds. Passenger rail interests need to be engaged with the FRA as requirements for higher-speed operations are developed. The uncertainties include what additional requirements, if any, may be imposed on freight operations sharing track with passenger operations exceeding 79 mph.

3.4 Operations and Maintenance Costs and Cost Sharing

3.4.1 Overview

This section discusses the technical issues associated with estimating how O&M costs should be distributed among each railroad corridor user in a corridor shared by multiple users, including the differences between avoidable and fully allocated costs. The different cost categories are identified, together with the operating parameters that drive costs. This is followed by a discussion of methods used to estimate costs as a function of usage by freight and passenger trains. The discussion is primarily concerned with the costs of operating a privately owned freight railroad that hosts a passenger rail service. Costing principles are the same where the host railroad is owned by a public agency, but the public agency normally does not expect to make a profit on invested capital and may treat expenses like depreciation differently. The resulting cost estimates may be used to support contractual agreements between host and tenant as described in Chapter 4 and the process for amending and updating contracts as described in Chapter 5. Much of the material in this section is taken from a predecessor study, "Cost Allocation Methods for Commuter, Intercity and Freight Rail Operations on Shared-Use Rail Systems and Corridors" (AECOM 2006).

Allocating railroad infrastructure and overhead costs fairly among different types of rail traffic is technically difficult, and in many situations there is really no single "right" answer. Once a rail line is put in place, a significant fraction of infrastructure O&M costs are fixed and can only be changed by either changing track quality or adding or removing features of the route, such as

a passing siding. Allocation of fixed costs will always be somewhat arbitrary. In addition, many infrastructure components subject to wear or degradation, such as rails and ties, have long lives and annual costs will vary over time as the components age. A decision has to be made between sharing costs "as incurred," recognizing that there could be considerable year-to-year variation as components age and when substantial renewals become due, or estimating long-run average costs and charging the same amount each year. A further complexity is that a passenger rail agency might fund a track renewal, as on the Downeaster route in Maine, and should enjoy the benefit of reduced annual maintenance costs in following years, instead of contributing to the next renewal cycle.

Because of the technical complexity and the presence of substantial fixed costs, there is a long (and contentious) history of methods to allocate railroad operating costs to a particular traffic. In the regulated era prior to the 1980 Staggers Act, much of the effort was directed at determining "fair" freight rates to charge freight shippers of different commodities. These allocation methods relied on historical cost data that the railroads were required to submit to the ICC. Statistical analysis of the data yielded a costing formula, which was then used to estimate the cost of a specific freight movement. Similar methods are still used by the STB to support the more limited freight rate regulation in force today. The STB's responsibilities for regulating passenger fares was eliminated with the formation of Amtrak, but it still has the responsibility to mediate disputes between Amtrak and freight railroads regarding access charges. Appendix B contains a discussion of the various costing issues brought before the STB for resolution during negotiations between Amtrak and the host railroad for the Downeaster service, and the resulting decisions. These are the most recent series of decisions by the STB on Amtrak incremental costing.

The following sections first introduce the primary cost categories that make up O&M costs, including periodic like-for-like replacements of worn-out track components such as rail. Then, the definitions and differences between avoidable and fully allocated costs are discussed, including how cost estimates may be used in calculating the share of costs allocated to freight and passenger operations using the same tracks. Finally, methods to estimate costs of a specific rail operation are discussed, including using historic actual costs and engineering analysis.

3.4.2 Railroad Operations and Maintenance Cost Categories

Table 3-1 shows the matrix of railroad O&M cost categories organized by operating function and by the nature of the expense. The shaded blocks in the table matrix highlight the functional and expense categories that may need to be apportioned among the users where a rail line is shared by multiple services. The rationale for sharing the costs among users within each of the expense categories is discussed in the following paragraphs.

Transportation Labor

Because these are not shared resources, in most cases, each operator employs its own train crews and other on-board personnel. In some cases, a freight railroad may provide passenger train crews (as on some Chicago area commuter lines and in Seattle), but this is usually the subject of a separate operating services contract. In contrast, dispatchers are always a shared resource, because one dispatch desk (workstation) has to be responsible for all trains on a rail line segment. Therefore, dispatching costs are always a line item in a shared cost analysis and would be shared between users per applicable agreements. For Amtrak intercity services to which Amtrak incremental costing applies, only incremental dispatching costs, if any, will be charged to Amtrak. Where two passenger operators share the same rail line, it may also be necessary to share certain station costs.

Table 3-1. Operations and maintenance cost categories.

Operating Function	Labor	Materials and Supplies	Fuel and Power	Other Expenses
Transportation	Line-haul train crews, Switching and yard crews, On-board services (passenger), Passenger station staffing (passenger), Dispatchers, Supervisors	Minor items	Electric power for traction on electrified lines, Diesel fuel, etc.	
Equipment Maintenance	Inspectors, Shop and terminal maintenance employees	Spare parts and materials for car and locomotive maintenance	Power for workshops and power tools	Contracted maintenance services, e.g., rebuilding components, Depreciation
Way and Structures Maintenance	Track inspection and maintenance, Signal and telecoms, Inspection and maintenance, Structures inspection and maintenance	Rails, Ties, Ballast, Replacement parts for signal and telecoms, Other construction materials	Diesel fuel for work trains and maintenance equipment	Equipment rental, Contract services, Depreciation
General and Administrative (G&A)	Management above first-line supervisor and technical specialists, Administrative staff of all types, Accounting, Legal services	Office supplies	Power for building services	Office rentals or leases, Contract services, e.g., for buildings, Insurance, Loss and Damage payments

Transportation Fuel and Power

In most cases, each operator uses its own fleet of locomotives, and diesel fuel is purchased separately by or on behalf of each operator. On a shared electrified railroad, power costs must be shared. This calculation can be complex, because there is no easy way to directly meter the power consumed by each train.

Equipment Inspection and Maintenance

Most passenger operators provide and maintain the equipment (cars and locomotives) that is dedicated to their services. Occasionally, one agency will rent or lease cars to another agency, but any associated maintenance services provided are the subject of a separate specific agreement. Therefore, cost-sharing issues rarely arise.

Maintenance-of-Way and Structures

Maintenance-of-way functions are always under the control of the host railroad. This is the most complex area related to cost sharing, because some cost categories are largely fixed (i.e., do not vary with use) and other costs vary with traffic volume and types of use in different ways. Also to be resolved is the approach to costs for periodic replacement of wearing components, such as rail. A rail replacement project may be treated as a capital cost in accounting terms, to be depreciated over the life of the rail, but the consumption of rail life may be treated as a maintenance cost in a cost allocation calculation. Most efforts to find realistic costing and allocation methods are concentrated in the maintenance-of-way and structures area. Maintenance of signal and telecommunications systems also fall into this area and are mostly fixed costs that vary little with the level of usage once specific systems are installed.

General and Administrative Activities

These are functions of the host (usually freight) railroad, which will devote some fraction of its effort to supporting tenant passenger operations. Some expenses can be directly attributed to the passenger operation, such as staff dedicated to managing the interfaces with the passenger operators, or specific insurances only required with passenger service. However, most administrative functions cannot be allocated in this way, and an alternative approach must be sought. Examples might be an allocation based on an overhead percentage, an allocation based on train-miles or some other measure of output, or a mix of both approaches.

3.4.3 Cost-Sharing and Allocation Approaches

Before methods to estimate costs and the appropriate distribution of costs between multiple rail corridor users can be discussed, it is helpful to define the two principal costing concepts that are used when estimating cost sharing between host and tenant. These concepts are avoidable costs and fully allocated costs.

Avoidable Costs

Avoidable costs (sometimes called incremental or marginal costs) are those short- and medium-term costs that would be directly avoided if the tenant's operations ceased. For a passenger rail tenant operating on a freight railroad, avoidable costs typically include wear and deterioration of track and structures that can be attributed to the passenger operation, a share of dispatcher costs, and the cost of management directly associated with the passenger service. Fixed costs of operating the railroad and compensation for utilizing an increment of capacity are not included. This approach is used to compensate freight railroads for accommodating Amtrak services, as required by the legislation that established Amtrak as the national intercity passenger rail operator.

Estimating avoidable cost becomes more complex if track quality or signal system improvements are required for a new passenger service. In this case, the avoidable-cost principle would require the passenger operator to be responsible for the difference between maintaining the higher quality under combined freight and passenger operations and what it would have cost the freight railroad for maintenance to freight service requirements. If the passenger agency had funded capital improvements to track and signals, then there is a further complication: maintenance costs to the freight railroad would be reduced for a number of years, until track components became due for maintenance or replacement. This issue was one of those at dispute between Amtrak and the host railroad prior to implementation of the Downeaster service, as discussed in Appendix B, Section B.2.2.

At present Amtrak is the designated operator of all intercity passenger rail services on shared corridors, using Amtrak's rights of access at avoidable costs. Amtrak already has operating agreements with all the major railroads, which include agreed-upon compensation for track use, usually expressed as a cost per train-mile. Amtrak and the host railroads will negotiate an extension of this agreement for a new service with an amended track-use fee, where appropriate, to reflect local conditions, including infrastructure investments funded by the passenger agency. Any disputes between Amtrak and the host railroad regarding the avoidable-cost fees for a specific service can be referred to the STB or the NAP for resolution. Under most Amtrak agreements with freight railroads, the NAP would resolve disputes over the application of the costing methodology in that agreement to a new service.

Fully Allocated Costs

In this approach, the host railroad's full costs are shared between the host and tenant on a logical basis. A freight railroad may also add a charge to the allocated full O&M cost to provide a

return on the capital investment in rail corridor capacity used by a passenger service, if the passenger agency has not used one of the alternative methods of paying for the capital cost of capacity as discussed is Section 3.3.1. Essentially, the freight railroad treats the passenger agency as it would a freight customer. A railroad may also agree to a hybrid approach where a share of some, but not all, fixed and overhead costs are allocated to the passenger operation, but this scenario is likely only if the agreement is part of a broader agreement that includes some other benefit for the freight railroad.

Fully allocated costing is most commonly used for commuter service over freight railroad tracks, where Amtrak access rights do not apply. The primary issue is establishing a full cost allocation method that is logical and acceptable to both parties. Establishing such a method can be straightforward where two freight railroads share the same tracks, because the types and quality of service required by host and tenant are the same. A freight railroad–to–freight railroad trackage rights agreement will typically apportion costs in proportion to car-miles operated over the shared territory. Where the tenant is a passenger service, arriving at a fair and logical cost division is more challenging, both at the technical level in deciding how costs are influenced by the presence of passenger service and in reaching a mutually acceptable formula in access negotiations.

3.4.4 Operations and Maintenance Cost Analysis

This section addresses two interlocking areas: the technical basis for determining the share of each cost category allocated to each service and the approaches used to incorporate technical understanding into shared track agreements for intercity and commuter services. This section is not intended to cover the specific cost allocations used for Amtrak avoidable-cost agreements based on the Amtrak statute and STC decisions, but rather to describe the technical and logical factors that drive costs on a shared corridor. Relevant cost categories include:

- **Dispatching.** Dispatcher workload is driven by the number of track miles in the dispatcher's territory, train-miles operated, and the complexity of operations. Adding passenger trains on a freight corridor is likely to add to dispatching complexity, given speed differences and station stops, adding workload. A logical approach for dispatching costs might be to allocate according to train-miles with an additional weighting for passenger trains. In some cases, a passenger operator has agreed to fund an additional dispatcher position so that passenger service can receive more focused attention, potentially reducing delays. Alternatively the passenger rail agency may fund a coordinator as a liaison between the host railroad and the passenger operator and agency, to help manage passenger service performance.
- **Electric Power.** Because there are no current electrified freight operations in the United States, this is an issue that arises when two electric passenger operations share tracks, as in the NEC. Because it is not easy to meter power at the point of use on each train, the best approach may be to estimate per-mile power consumption as a function of train size (number of cars) and type of service, using the results of TPC analysis and electric power prices to establish and calibrate a per-train-mile charge.
- **Track Maintenance.** This area is the most complex for cost allocation, because track degradation under different traffic types is difficult to quantify. The most comprehensive studies on this issue have been by Zeta-Tech, who developed the TrackShare model, described in papers and presentations for the Transportation Research Board and in a report prepared for the FRA (Zeta-Tech 2004). This method had been used in a number of settings, including cost estimating for the proposed Midwest network, cost allocations between users of the NEC, and cost allocation for Amtrak service on freight railroads. Zeta-Tech takes a fundamental engineering approach, calculating the cost of wear and degradation of track and track components as a function of loads on the track. These costs are a function of axleload, speed, and track characteristics such as FRA track class, grade, and curvature. The model yields Engineering Adjustment

Factors (EAFs) to apply to a base cost estimate as a function of traffic type and track characteristics to obtain a cost estimate for a specific traffic mix. This model is particularly useful for calculating a logical division of costs when a passenger tenant requires a higher track quality than the host freight railroad. Because the model is too complex to simply incorporate into a cost-sharing contract, the usual process is to use the analysis to estimate a per-car-mile or per-train-mile charge for the planned service and incorporate the result into the agreement.

- **Track Inspection.** Both FRA regulations and industry practice require regular track inspections for defects. The presence of passenger service may or may not trigger a change in inspection practice depending on specific traffic levels and speeds. If a change in practice is required, then the additional cost would be allocated to the passenger expense. Otherwise, costs would be shared among the services in a fully allocated approach, most logically as a function of ton-miles adjusted by EAFs.
- **Other Infrastructure Inspection and Maintenance.** This area covers bridges and structures as well as signal and train control equipment. Most of these expenses are only weakly dependent on traffic level and type, and cost allocation is somewhat arbitrary. An allocation based on adjusted ton-miles for structures and train-miles for signal and train control systems would be logical. Some passenger services may require improved signal and train control systems to permit increased speeds or to add capacity. If this is the case, all or part of the additional cost of inspecting and maintaining the improved systems over the original installation would be the responsibility of the passenger operator. For example a passenger operator and host railroad may fund a conversion of automatic block signaling to centralized traffic control and add powered switches at passing sidings. Because the improvements benefit both freight and passenger service, both host and tenant would share additional inspection and maintenance costs, if any.
- **General and Administrative Expenses.** In most cases, there is no specific cause-and-effect relationship between selected G&A expenses and the level and mix of train operations. The only exception is where staff are specifically dedicated to the passenger affairs. Otherwise, the allocation may be determined in proportion to train-miles or represented as a percentage or fee on other passenger-related expenses, or, in some cases, the parties may agree to a fixed annual fee.

3.4.5 Application to Intercity and Commuter Operations

The foregoing discussion summarizes the technical issues involved in cost sharing. The manner in which these technical issues are brought into negotiations between the passenger rail agency and a host freight railroad depends on the details of each service, as summarized in the following paragraphs.

Amtrak Intercity Service with No Service-Specific Infrastructure Investments

Amtrak compensates host freight railroads for intercity passenger operations on an avoidable-cost basis. Agreements for a new or expanded service will be based on existing Amtrak operating agreements with mutually agreed-upon variations to reflect specific local circumstances. Disputes can be resolved by the NAP or by the STB, which has the power to impose a decision on Amtrak and the host railroad.

Amtrak Intercity Service where a State Passenger Rail Agency Has Funded Added Rail Corridor Capacity or Upgraded Infrastructure

Amtrak will negotiate a track-use fee agreement with the host railroad for the specific service with the host railroad, proposing fees based on previous experience in comparable situations, and taking into account the passenger agency's investment, track class, and added signal and train control equipment. The parties are free to support their position with technical analyses, but there is no requirement for such analysis. If Amtrak and the host railroad cannot agree, then they can

appeal to the STB, supporting their position as they see fit. The state or regional passenger rail agency must work with Amtrak and may choose to directly fund a track maintenance gang or a dedicated dispatcher to ensure service quality.

Commuter Operations Hosted by a Freight Railroad

The commuter rail agency will have to compensate the freight railroad for all or most fully allocated costs. The details of individual agreements are highly variable and will reflect local circumstances, especially track and signal system improvements funded by the commuter rail agency. Many of the sharing approaches mentioned previously regarding individual O&M expense items and technical cost analysis may be reflected in the resulting agreement. However, it is essential that the final agreement is simple to administer, such as a formula that uses easily determined operations metrics, such as car- and locomotive-miles and train-miles.

CHAPTER 4

Content of Shared-Use Access and Operating Agreements

4.1 Introduction

This section discusses the content of typical shared-use agreements between host and tenant railroads sharing a rail corridor. In many cases, the agreements must recognize the roles of all parties involved in providing passenger rail service over a rail corridor, such as Amtrak in the case of an intercity service or a train operations contractor in the case of a commuter service. This section is written from the perspective of a passenger rail agency implementing and developing an Amtrak intercity or commuter passenger rail service, but in most cases not planning to directly manage train operations. Passenger rail agencies must enter into multiple agreements with different parties to establish a service, and those parties often must enter into agreements with each other.

Specifically this section covers shared-use agreements from the point of view of a state or regional passenger rail agency, such as the NNEPRA responsible for the Downeaster service, the California Joint Powers Authorities (JPAs) responsible for the Caltrain commuter service and the Capitol Corridor Amtrak services, or METRA commuter rail services in Chicago. Generally roles and responsibilities for an Amtrak-operated intercity service differ from those for a commuter rail service, thus separate discussions are provided. Also included are the roles of federal government agencies such as the FRA and the STB with regard to negotiations and agreements, *not including* detailed requirements for financial grant or loan applications to the FRA or the FTA.

Section 4.2 discusses the overall framework of organizations and relationships needed to implement and operate a passenger rail service and some general points regarding the roles and responsibilities of the different parties.

Section 4.3 discusses specific details for Amtrak intercity service, including the roles and responsibilities of Amtrak, the host railroad(s), and the passenger rail agency. This subsection also includes:

- Definition of what services are to be provided by each party, especially including Amtrak's responsibilities, and charges for each service.
- Agreement contents relating to capacity improvements and track upgrades on the corridor to accommodate the planned passenger rail service.
- Agreement contents relating to service-specific performance (journey times, OTP), including incentives and penalties.

Section 4.4 discusses specific details for commuter rail services, including the roles of the commuter rail agency, the host railroads, and O&M contractors. This subsection includes:

- Definitions of what services are to be provided by each party, including their relationships with each other as well as with the commuter rail agency.

- Agreement contents relating to track improvements, additional capacity, and other capital investments to be accomplished before service startup and in subsequent years as ridership and the number of planned trips grows.
- Agreements for day-to-day operations (including performance metrics, standards, and incentives and penalties) and any time-of-day operational restrictions to be observed by host or tenant.
- Agreement on sharing of capital and O&M costs.

Section 4.5 summarizes the provisions in passenger rail agreements concerned with managing change over time as demand for passenger and freight rail service evolves, and as funding for passenger rail capital and operations expenses varies.

4.2 Types of Agreements Needed to Implement Passenger Rail Service

This section discusses the various agreements between participating parties involved in providing a passenger rail service. The discussion assumes that the proposed service is a new initiative for the passenger rail agency and host railroad and will operate over a route where there is no existing service of the same type. In many cases, this assumption will not be true—existing arrangements may be in place that can be modified or adapted for the new service. However, the completely new service on a new route is likely to be the most complex situation for an agency to process.

Figure 4-1 illustrates the different host–tenant pairings that can exist, each of which will require an agreement between the parties spelling out rights and responsibilities. Tables 4-1 and 4-2 expand on Figure 4-1 to identify all agreements that a sponsoring passenger rail agency must ensure are in place for a specific passenger rail service, including agreements with host passenger or freight railroads, Amtrak, and other providers of passenger rail O&M services. If an individual service travels over rail territory owned by more than one railroad, then a set of agreements specific to each host railroad will be required. The diversity of possible relationships, combined with large variations in passenger and freight traffic levels, means that almost every shared-use situation is unique, and agreements must be negotiated for each particular set of circumstances.

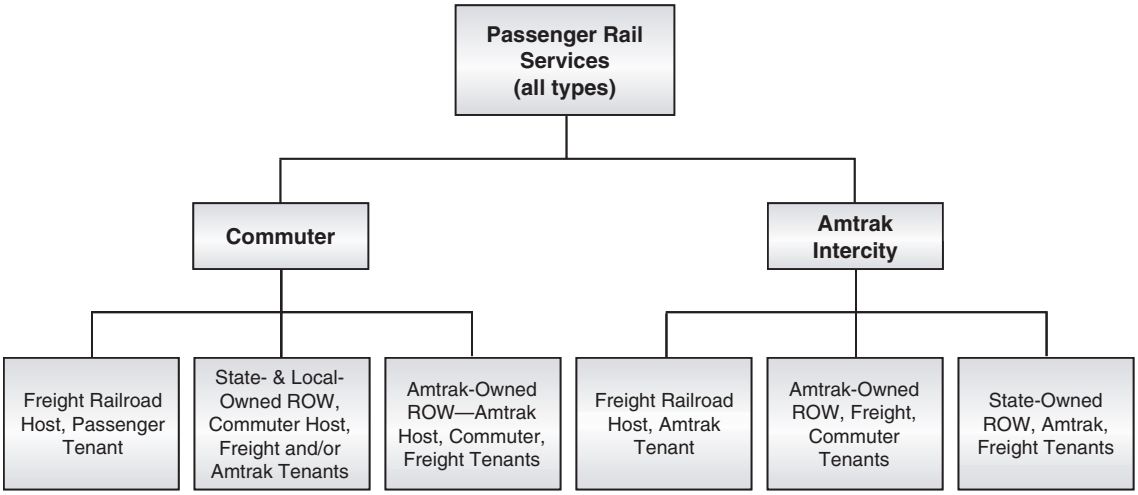


Figure 4-1. Passenger rail host–tenant relationships.

Table 4-1. Types of Amtrak intercity rail service agreements.

Right-of-Way Owner (Host)	Agreements with Freight Railroad	Amtrak Agreements	Agreements with Other Parties
Freight Railroad	• Amtrak contracts with freight railroad for access to corridor, dispatching and infrastructure maintenance, relying on Amtrak rights and operating agreements. • PRA[1] may contract directly with freight railroad for capital improvements for capacity and performance, and added ROW maintenance contributions.	• With PRA for all O&M services for a defined service and fare structure. • With Amtrak concurrence, PRA may provide equipment or pay for rehabilitation of out-of-service cars. • Amtrak and PRA may need FRA safety approval for aspects of proposed service, e.g. to use non-FRA-compliant cars or locomotives. • The infrastructure owner (freight railroad) would apply to the FRA for approval of PTC plans and installations for passenger service.	• PRA cannot contract with other parties for passenger railroad operations over freight track using Amtrak access rights. • PRA may contract separately for equipment maintenance (rare) or "amenity" services, e.g., on-board food service, and station services.
Amtrak	• Amtrak usually has agreements with freight RR to permit access for freight service on its territory (e.g., on NEC). PRA not usually involved.	• With PRA for all O&M services, including ROW access. • With Amtrak concurrence, PRA may provide equipment or pay for rehabilitation of out-of-service cars.	• As above, except that theoretically a PRA could choose to contract for an intercity service independently, but then could not rely on Amtrak rights for freight railroad access.
State and Local Agency	• PRA have access agreement with freight railroad for freight service over state or locally owned track	• Amtrak can exercise statutory right of access for existing services. PRA will normally contract with Amtrak for O&M for state-supported services.	• As above.

[1] State, regional, or local passenger rail agency.

In almost all of these different arrangements, the passenger rail agency provides the glue that holds everything together but rarely takes direct responsibility for O&M of a rail service.

The contractual relationships needed to provide a specific passenger rail service are a function of a number of factors that together determine which of the different contract arrangements summarized in Tables 4-1 and 4-2 apply. The overriding factor is whether the service will be an Amtrak intercity service or a commuter service.

For commuter service, the factors that will help define the general contractual approach are:

- Whether the commuter rail agency intends to set up an operating entity itself, or plans to contract with a service provider to operate and maintain the service. O&M services will include track and infrastructure maintenance if operating over track owned or leased by the agency. The O&M contractor could be Amtrak, the freight railroad, or an independent commercial firm.
- Whether the commuter rail agency must invest in infrastructure upgrades to increase capacity, track quality, or signal system capabilities to support the desired passenger service frequency, journey times, schedules, and OTP.
- Whether the commuter rail agency is considering contracting with the host freight railroad for services other than access, infrastructure maintenance, and dispatching.

Table 4-2. Types of commuter rail service agreements.

Right-of-Way Owner (Host)	Agreements with Freight Railroad	Amtrak Agreements	Agreements with Other Parties
Freight Railroad	• Contract with CRA[1] for access, dispatching, and ROW inspection and maintenance. • CRA may contract with freight railroad for train crew and other O&M services if both parties so desire.	• O&M services if CRA selects Amtrak as the contract operator. • Amtrak would not be involved in developing agreements between a CRA and a host freight railroad, even if Amtrak is the selected contract operator.	• CRA may contract for train crew, on-board services, and equipment inspection and maintenance with a single or multiple commercial firms. • CRA normally contracts with a car builder for provision of equipment (cars and locomotives) for the proposed service. In some cases, contract includes ongoing equipment maintenance services.
Amtrak	• Amtrak may have agreements with freight railroad to permit access for freight service on its territory (e.g., on NEC). CRA not usually involved, but could affect capacity.	• CRA must contract with Amtrak for access and infrastructure maintenance. • CRA may select Amtrak for train operations and/or equipment maintenance services.	• Amtrak would not be involved in agreements with other parties, unless Amtrak subcontracts selected O&M services to other parties. • CRA normally contracts with a car builder for provision of equipment (cars and locomotives) for the proposed service. In some cases, contract includes ongoing equipment maintenance services.
State and Local Agency	• Agreement between CRA and freight railroad to permit access for freight service in state- and local-owner territory. • CRA may contract with freight railroad for selected O&M services if both parties so desire.	• CRA may select Amtrak to be O&M contractor, or contractor for selected O&M services by mutual agreement.	• CRAs frequently contract for O&M services with commercial firms (i.e., other than Amtrak or a host freight railroad) for all O&M services, including track maintenance. A single "bundled" contract may be used or separate contracts with different parties for each service.

[1] State, regional, or local commuter rail agency.

- If contracting for O&M, whether to bundle all services in a single contract or to contract separately for each kind of service (e.g., train operations, equipment maintenance, and track maintenance).

For intercity service, the factors that will help define the general contractual approach are:

- Whether the passenger rail agency must invest in infrastructure upgrades to increase capacity, track quality, or signal system capabilities to support the desired passenger service frequency, journey times, schedules, and OTP.
- Whether the passenger rail agency expects or is able to rely on Amtrak to supply equipment for the service or must purchase or lease passenger cars independently.

Once the passenger rail agency has selected a general approach to the provision of the service within the constraints applicable to the type of service and host railroad, the agency can move forward with developing the specific agreements. The following paragraphs provide an introduction to the principal relationships, concentrating on those where a freight railroad will host a proposed passenger service.

4.2.1 Introduction to Amtrak Intercity Service

Intercity service must be operated by Amtrak to benefit from Amtrak's right of access to the national railroad network; dispatching priority; and incremental cost pricing for access, infrastructure maintenance, and dispatching. After completing a thorough feasibility study in cooperation with Amtrak, as described in Chapter 2, using analysis and modeling as described in Chapter 3, the passenger rail agency must conclude an agreement with Amtrak to operate the service. Amtrak will negotiate with the host railroad to implement the proposed service under its operating agreement with that railroad. If there is no existing agreement, Amtrak will negotiate a new agreement. The passenger rail agency may agree with the host railroad (usually freight) to fund all or part of capital improvements to increase capacity and/or reduce journey time as well as to ensure adequate OTP. In addition, the passenger rail agency may agree to provide ongoing funding to the host railroad for track maintenance and dispatching resources, to assure high service quality and reliability. These expenditures supplement normal Amtrak payments for access and OTP. Although the host railroad is usually a freight railroad, similar access agreements must be established where a commuter railroad is the host.

These arrangements with Amtrak and the host railroad take care of track access and train operations. The final area in which agreement is required concerns provision of equipment (passenger cars and locomotives). Amtrak may or may not be able to provide suitable cars and locomotives for a proposed new service. The passenger rail agency must explore equipment options with Amtrak and reach agreement as to responsibility for equipment supply. If the passenger rail agency is purchasing cars and/or locomotives, Amtrak must agree that the cars are suitable for the proposed operation and that maintenance and servicing arrangements are practical.

In most cases, the parties involved in implementing and operating an intercity passenger rail service are the state, local, or regional passenger rail agency; Amtrak; and the host railroad. Other parties may be involved in minor roles, such as providing services at stations (sometimes developed and owned by the host community) and providing on-board food service.

4.2.2 Introduction to Commuter Service

Amtrak's access rights cannot be exercised for commuter service, and a commuter rail agency must negotiate at arm's length with the individual host freight railroads. The agency must also negotiate access with Amtrak if Amtrak lines are used. Amtrak owns little main-line track outside the NEC but operates and maintains several big-city passenger terminals used by commuter services (such as Washington Union Station, Los Angeles Union Station, New York City Penn Station, and Chicago Union Station).

If the commuter rail agency owns or leases the ROW, then there is no access issue for commuter service, but a former freight railroad owner may require access as a condition of the sale or lease to provide ongoing local or through freight service. The agency may also have to accommodate existing or new Amtrak service, under Amtrak's access rights. In rare cases, two commuter agencies may agree to share infrastructure. An example is where NICTD trains from Indiana locations access downtown Chicago over tracks owned by METRA and used by METRA trains.

As well as basic access, a commuter rail agency, whether host or tenant, will have to work out agreements among all users to share infrastructure inspection and maintenance costs, dispatching costs, and the cost of capital investment for capacity and service performance. In most cases, the agency will also have to arrange contracts for O&M services with qualified suppliers and for the acquisition of rolling stock. If the service is generally operated over track owned by a host freight railroad or Amtrak, then the host will likely have to approve the proposed contractor and equipment as acceptable for the proposed service.

4.3 Amtrak Intercity Service

4.3.1 Introduction

This section describes the principal items that should be included in agreements for an intercity passenger rail service operated by Amtrak. As described elsewhere in this Guidebook, Amtrak intercity services are those for which Amtrak can exercise its right of access to the U.S. railroad network at incremental cost. Appendix B discusses the definitions of commuter and intercity service, which in essence state that intercity services operate over routes exceeding 100 miles in length and are used primarily by intercity travelers rather than regular commuters. The following factors also influence the content of agreements for Amtrak intercity service:

- Amtrak's rights to access and incremental costing are of major advantage in implementing intercity passenger service on freight railroad corridors. No passenger rail agency to date has attempted to initiate this type of service without working through Amtrak and having the service operated by Amtrak. Note that Amtrak sometimes acts as a contract operator for commuter rail agencies but in this situation cannot exercise its access rights.
- Amtrak maintains liability agreements with freight railroads (the Amtrak umbrella) that relieves the passenger authority of the need to negotiate liability issues with the freight railroad for each individual service. However, separate liability agreements may be needed for station activities.
- Either Amtrak or the passenger rail agency may supply rolling stock for the proposed service, depending on car and locomotive availability in Amtrak's fleet and service requirements. For example, California purchased bi-level passenger cars and low-emission locomotives for corridor services and North Carolina purchased rebuilt Heritage (pre-Amtrak) cars for state-supported services.
- In principal, Amtrak has broad rights of access at incremental cost to any rail corridor in the United States, including railroad owned by state agencies and commuter systems as well as freight railroads. In practice, the service requirements of new state-supported services (which usually increase service frequency and seek to reduce journey times) have involved investment in railroad infrastructure and sometimes ongoing additional expenditure to maintain passenger-level track quality and signal system performance. Passenger rail agencies implementing a new or expanded intercity service have often found such investments to be essential to achieving high-quality services.

The involvement of Amtrak means that a three-way set of consistent agreements between the passenger rail agency, the host railroad, and Amtrak are required, as illustrated in Figure 4-2.

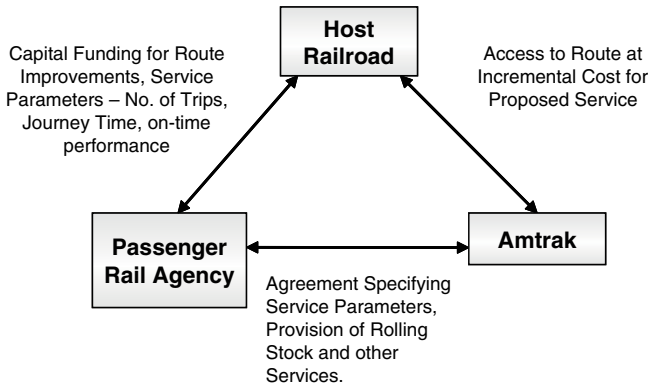


Figure 4-2. Primary contract relationships for Amtrak intercity service.

The content of each of the three agreements shown in Figure 4-2 must be consistent with each other and in combination include all the elements needed to ensure a successful passenger rail service. The specific contents of the agreements are described in the following paragraphs.

4.3.2 Inputs to and Preparations for Finalizing the Agreements

Chapters 2 and 3 have discussed preparations for negotiations with Amtrak and the host railroads and the main points of negotiation that must be addressed. In addition, Chapter 3 describes the types of analysis of train performance, rail corridor capacity, and capital O&M costs that may be needed to support negotiations and capital investment decisions. The key points covered in previous sections are summarized in the following subsections.

Long-Term Vision Plan

The passenger rail agency should have a long-term vision plan for the development of railroad services in the state or region. Ideally the plan should include both freight and passenger rail services and have been prepared by the agency in consultation with other state agencies having an interest in transportation, as well as with providers of rail and related services of all types. With regard to passenger service, the plan should describe the long-term goal for passenger rail developments and the principal steps in developing services between the present and the goal. The PRIIA now requires state agencies to prepare such a plan as a precondition to accepting capital grants for intercity passenger rail service under the various programs administered by the FRA.

Feasibility Study

A thorough feasibility study for the proposed intercity passenger rail service should be prepared in cooperation with Amtrak and preferably the host railroad(s) on the corridor. As noted previously, some host freight railroads prefer to be deeply involved in feasibility studies to make sure that their concerns are addressed early in the process, while others prefer only limited involvement. The feasibility plan differs from the vision plan in that it focuses on one corridor and service, rather than a whole state or region, but both should be long term, covering a period that reflects the service life of infrastructure investments. Almost all passenger rail projects involve investment in railroad infrastructure, including ROW, track and signal improvements, station and terminal investments, and sometimes purchase or lease of the ROW. These investments have a service life of at least 20 years, and the long-term plan is essential to ensure that benefits from the investments are fully realized.

The feasibility study starts with the goals for the service at each stage in its development, such as:

- Target journey times, station locations, and train departure times.
- Desired number of daily trips.
- Planned accommodations on train.

The results of the study are the actions needed to accomplish the planned service at each development stage, including:

- Proposed physical infrastructure investments (track upgrades, sidings and double track, signal systems, etc.).
- Estimated cost of infrastructure investments.
- Expected service performance.
- O&M requirements and the associated costs, including where specific maintenance activities are required to ensure planned service quality.
- Passenger car and locomotive requirements, and plans for acquisition and maintenance of suitable equipment for the planned service.

Because there will be considerable uncertainty regarding markets for passenger and freight rail services and the availability of funding for passenger rail capital and operating expenses, the plans must be flexible and structured to respond to unexpected developments. Provision for regular reviews and updates is essential.

The penalties for not planning ahead can be substantial. Focusing on just the short term—thinking "just get the service started and then worry about the long term later"—can lead to missed opportunities. When further development is needed to meet increasing patronage, agencies without a basic long-term framework agreed upon with the host and other users have found it very difficult or costly to take the next step.

Making Access Agreements and Contracts Detailed, Unambiguous, and Consistent with Long-Term Plans

As illustrated in Figure 4-2, a three-way set of agreements must be put into effect for Amtrak intercity service on a rail corridor. Each of these agreements should embody the same service specification as developed in the feasibility study and as further negotiated with Amtrak and the host railroad(s). The agreements must provide a long-term framework to give all parties assurance that their future business and service development will not be compromised and that benefits from infrastructure investments can be fully realized. Because the future is inherently unpredictable, the agreements must include a process by which service changes can be negotiated to accommodate changes in performance and traffic levels, within agreed-upon limits. For example, if the long-term plan envisions starting with four round trips per day for a given passenger service, increasing to twelve round trips as demand grows and funding becomes available, then the agreement should reflect that and agree on what investments are required to make service increases possible. If the freight operator wants to assure the availability of a given capacity at different points over the term of the agreement, then the agreement should specify what passenger service levels are consistent with meeting that goal, what investments are needed to make this possible, and how the costs will be shared.

Experience has shown it is unwise to leave some matters for future discussion or agreement or to accept verbal assurances that, for example, additional passenger trains can be accommodated at some point in the future. Negotiators who meet for a later round of discussions are unlikely to be different from those that negotiated the original agreement. Any understandings or assurances that were not explicit in the original agreement will not be enforceable, and changes in personnel, policy, or external circumstances could mean that non-binding assurances have been forgotten or will no longer be honored.

Experience also has shown that the agreements should be highly explicit and cover all aspects of operating needs of corridor users. Lower-probability scenarios should be considered and provided for in the agreements, if possible. For example, one passenger authority purchased a rail corridor from a freight railroad, which retained trackage rights for freight service on the corridor. Fifteen years later, the passenger authority is now facing difficulties because the freight railroad wants to operate more freight trains than either party envisioned when the original agreement was signed. The original agreement lacks any provision to address this situation, thus a broad renegotiation of the agreement is required.

Flexibility, Renegotiation Periods, and Dispute Resolution

All agreements should contain procedures both for periodic revision or renegotiation of contracts and a mechanism to resolve disputes. Given the inherent uncertainties in demand for freight and passenger rail service and in funding availability for passenger rail developments, many agreements provide for renegotiation on request by either party. Other agreements provide for reviews at regular, often 5-year intervals with provisions for intermediate

adjustments where necessary. Several parties commented that shorter intervals tended to produce an inefficient and frustrating state of continuous negotiation. Some contract elements, such as access and maintenance costs, may be subject to annual adjustment based on an agreed cost index.

For Amtrak-operated services, disputes between a host and tenant railroads can be taken to the STB or the NAP for resolution. The NAP was created by Amtrak and host railroads to resolve disputes and most Amtrak operating agreements require disputes to be submitted to NAP in the first instance. Reference to the STB would be used in the absence of an agreement to use the NAP. There is a significant case history of past decisions and other legal proceedings related to Amtrak service, and the likely outcome of referring a dispute to the NAP or the STB is somewhat predictable. This predictability tends to simplify negotiations, and disputes often can be resolved relatively easily. Appendix B, Section B.2.2, describes in detail how a number of disputes between Amtrak and GuilfordGuilford Rail System that arose during implementation of the then-new Downeaster service were resolved by the STB. These disputes were resolved before implementation of PRIIA, but the process and outcomes would have been little changed by that legislation, except that the powers to require a host railroad to accommodate increased speeds and the number of trips on an existing Amtrak corridor were transferred from the U.S. Secretary of Transportation to the STB (see Appendix B, Section B.2.8).

4.3.3 Agreements between Amtrak and the Freight Railroad

The agreement between Amtrak and the host freight railroad covers the access to the host railroad's tracks for the proposed service; the required performance of the service, such as OTP; and payments by Amtrak to the host for the incremental costs incurred by the host railroad in operating the specified Amtrak service. In many cases, the specific agreement for an individual service is based on an existing Amtrak operating agreement with the same railroad, with amendments as required for the specific features of the proposed service. The specific content may include:

- **The specification for the service—number of daily trips, departure times, journey time, and OTP requirements.** These details may be defined by reference to the agreement between the host railroad and the passenger rail agency, where the railroad agrees that a specific set of investments in the track and signal system will support the required corridor capacity and train performance.
- **Payments by Amtrak to the railroad for operating the proposed service.** These payments are typically expressed as a payment per train-mile or sometimes per car and locomotive-mile for track maintenance and payments for administrative coordination costs incurred directly on behalf of the passenger service. Agreed-upon unit costs will reflect the need to maintain passenger-quality track and the costs of maintaining signal and train control investments where these are triggered by passenger service requirements, less an allowance for capital investments by the passenger rail agency.
- **An agreement for incentives and penalties for OTP.** In the past, these agreements have typically specified performance payments based on system-wide OTP for a specific railroad. Such an agreement means a single poorly performing service can result in a system-wide performance below the bonus threshold, removing any incentive for a freight railroad to maintain good OTP on other routes. More recently, Amtrak has been implementing alternative corridor-by-corridor OTP measures, such as limits on total monthly delay minutes, which provide a more effective framework for achieving adequate OTP. These enforceable metrics may be linked to infrastructure investments and financial support for track maintenance funded by the responsible passenger rail agency. This approach is discussed in more detail in Section 4.3.5.

4.3.4 An Agreement between the Passenger Rail Agency and Amtrak

With a few exceptions, a state or regional passenger rail agency funds capital and O&M costs of a passenger rail service on an intercity corridor. The exceptions are those services that were part of Amtrak's core network and historically have been fully funded by Amtrak. However, under Section 209 of PRIIA, state support will be required for all short-haul services including those historically funded by Amtrak, except for NEC services. In addition, the passenger rail agency often provides capital funds for track and signal upgrades to accommodate additional trips and shorter journey times and to improve service quality.

The involvement of state or regional passenger rail agencies means that an agreement between the agency and Amtrak must be negotiated to set out the details of services to be provided by Amtrak, the compensation to be provided to Amtrak for these services, and commitments by the agency to take other actions (such as the provision of passenger station facilities and services and funding and contracting with the host railroad for track and signal upgrades) that will make the planned service feasible.

The agreement between Amtrak and a state passenger rail agency for a state-supported service will typically include the subject areas described in the following three subsections.

Definition of the Services to be Provided by Amtrak

Term of the Agreement and Adjustment Period. The term of the agreement depends on both the long-term goals of the service and the characteristics of funding sources. Usually a long-term (20 years or more) framework agreement should be used, with provisions for regular adjustments to funding formulas and the service specification. The rationale for a long-term agreement is to ensure that the agency can realize the benefit from long-life infrastructure investments, while the adjustment provisions allow for the agency and Amtrak to respond to traffic demand and the availability of funding for both planned infrastructure investments and for O&M expenses.

A Mutually Agreed-upon Specification for the Service. The specification for the service includes frequency and schedules, fare levels, capacity (seats), planned journey time, etc. If the service will be implemented in stages as demand and funding permit, these stages and a prospective timetable will be included.

Specific Services to be Provided by Amtrak. These services usually include access to the freight corridor; train crew; on-board services including food service; use of Amtrak's ticketing and reservation system; provision of station services (including staffing for ticketing and baggage service, if required) or provision of Amtrak's "QuickTrak" ticketing machines; and provision, maintenance, and servicing of equipment (passenger cars and locomotives). In some cases, the state agency may make independent arrangements or be involved in the selection of a food service provider, station services, and equipment acquisition in cooperation with Amtrak.

State Financial Support to Amtrak for Operating and Maintenance Costs

Amtrak states that, in the recent past, it has been reimbursed for approximately 70 percent of fully allocated O&M costs for a typical state-supported service. This reimbursement includes all direct costs and a contribution toward shared and overhead costs. Costs are estimated from an analysis of cost data from Amtrak's cost allocation system, less farebox revenue. Amtrak's position now is that state passenger rail agencies should bear the full direct cost of these services. However, state passenger rail agencies have often disputed Amtrak's cost allocation calculations and have asked for more transparency in Amtrak's accounting systems and cost allocation calculations. To address this issue, PRIIA (Section 209) includes a requirement that Amtrak develop new standardized methodology for cost allocation in cooperation with passenger rail agencies

that support Amtrak services. If the parties cannot reach agreement, the STB may be asked to help resolve the issue.

The agreement should also cover any penalties or bonuses for service performance. In part, these will reference and be consistent with agreements between Amtrak, the host railroad, and the passenger rail agency. The agreement must set expectations for performance metrics in Amtrak's control, specifically Amtrak-caused delays and provision of the planned seating and on-board services on each trip.

There are few opportunities to obtain federal grants to cover all or part of intercity O&M costs. Amtrak's regular annual funding covers the O&M cost of core services and the difference between state support and actual total O&M costs on state-supported services. However, some services located in air quality non-attainment areas (such as the Downeaster) have been able to obtain support from Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds. FRA grants are available for capital projects, as discussed in the following subsection.

Provision of Equipment (Cars and Locomotives)

Historically, Amtrak had enough spare equipment to support new services and would provide this equipment without charging for capital expenses or major overhauls. In recent years, however, all Amtrak's useable equipment was fully committed to existing services, and Amtrak lacked funds to overhaul unserviceable cars or purchase new ones. State passenger rail agencies were expected to provide new or secondhand equipment or to fund rehabilitation of unserviceable cars or locomotives. More recently, the situation has eased. Equipment rehabilitation is an eligible use of intercity passenger rail funding authorized in PRIIA and ARRA, and Amtrak has initiated a rehabilitation program for suitable out-of-service cars. Plans to purchase new cars and locomotives are also being developed, with support from PRIIA and ARRA funds, to provide a near-term boost to the available fleet and replace life-expired equipment.

Given this background, passenger rail agencies must develop an agreement with Amtrak regarding the source of equipment and arrangements for equipment maintenance. One choice is to agree to operate the planned service with equipment provided by Amtrak, out of the expanded fleet of cars and locomotives that will become available from Amtrak's developing equipment program. The alternative is to acquire equipment independently from a manufacturer. Agencies choosing this route must provide themselves with adequate technical resources to manage such a procurement, especially if the cars or locomotives are of a novel design (such as the updated Talgo trains under consideration by some agencies) or the cars or a proposed operation are not fully compliant with FRA safety regulations. The FRA will want to review the train design and proposed operation to ensure it is safe, and Amtrak will want to ensure the trains are suitable for the proposed service and are safe and reliable. Amtrak and the agency will also need to ensure that inspection and maintenance arrangements for the new cars are put in place, including any staff training, special maintenance equipment that may be required, and a spare parts supply. An alternative (used for Talgo trains operating the Cascades service in the Pacific Northwest) is to contract with the manufacturer for maintenance and servicing.

4.3.5 Agreement between the Passenger Rail Agency and the Host Railroad(s)

Agreement with the Host (Usually Freight) Railroad for Capital Improvements

Experience in recent years has shown that introduction of a new or expanded quality passenger rail service is rarely possible without capital investments in the corridor. Investments are typically needed to increase capacity and to upgrade track and signals to passenger service standards

so that the desired service performance can be achieved. Amtrak has limited funds for capital investments outside of the NEC, so the state passenger rail agency must assemble the funding. Typical sources are state transportation bonds, a variety of state and local grant programs, and occasionally federal funds from the FTA or the Federal Highway Administration (for grade crossing improvements). Recently, substantial funding has become available through the FRA from PRIIA and ARRA. In some cases, a state will link passenger and freight funding programs in one improvement package. Note that the funding source has no influence on whether the service is classified as commuter or Amtrak intercity.

The agreement with the freight railroad for capital improvements will reiterate the service specification, including staged development, where planned. Then, the passenger rail agency and the railroad will agree on the specific improvements required to support a specified service—number of trips, journey times, and OTP. For a staged development, the agreement will define each stage by the service specification and the corresponding infrastructure improvements. It is essential to link specific improvement projects (1) to specific train frequencies, journey times, and punctuality metrics, properly supported by analysis results and accepted by the host freight railroad, Amtrak, and the passenger rail agency, and (2) with defined actions to be taken by the host railroad in the event of non-compliance. Table 4-3 shows illustrative service performance metrics that experience has shown to be successful in achieving good service quality. Absent an enforceable agreement, there is a serious risk that infrastructure investments will fail to yield the expected benefits.

The state or regional passenger rail agency should execute a master agreement with the freight railroad covering the basic linkage between improvement projects and passenger train trips, journey time, and service performance, plus a "task order" mechanism for executing individual projects. The passenger rail agency normally contracts with the freight railroad to carry out the project. The railroad will carry out the project with its own maintenance forces or using contractors at its discretion. Usually, freight railroad labor agreements contain provisions for use of contractors, and the railroad will have to abide by these agreements. Experience has shown that a fixed-price contract

Table 4-3. Illustrative service performance metrics[1] and agreement for an Amtrak intercity service.

Phase No.	Description (Upon Completion of Listed Projects)	Round Trips per Day	Scheduled Trip Time (A to B)	Delay Ceiling[2] (Maximum Host-Responsible Delay Minutes[3] per Trip)
1	*Baseline – Current Service*	*2*	*3h 30m*	*17*
2	Specified Operating Improvements	2	3h 30m	14
3	Specified Maintenance Improvements	2	3h 30m	12
4	Projects 1 and 2	3	3h 30m	11
5	Projects 3 and 4	3	3h 15m	9
6	Projects 5, 6, 7, and 8	4	3h 15m	8
7	Projects 9 and 10	4	3h 0m	7

[1] The performance metrics should be negotiated and accepted as feasible by all parties before being put into effect, supported as necessary by operations simulation analysis as described in Chapter 3.

[2] *Delay Ceiling:* Average host-responsible delay for all trips over a 1-month period (total delay minutes in 1 month divided by the number of trips operated). Temporary adjustments to the delay ceiling may be agreed upon for major track or structures maintenance projects.

[3] *Host-Responsible Delay Minutes:* Obtained from Amtrak's Conductor Delay Reports for delays due to interference from other trains (freight, commuter, other intercity passenger trains), routing delays, slow orders, signals, maintenance-of-way work, and detours from the normal route.

Note: If in any calendar month, actual average host-responsible delay minutes between points A and B exceeds the delay ceiling, the host railroad will make, at its sole expense, operational, maintenance, or capital improvements necessary to reduce average delay minutes to below the delay ceiling within 2 calendar months after the initial failure to comply with delay requirements.

with the railroad for each project is the best approach, giving the railroad flexibility and an incentive to manage the project efficiently. Time-and-materials or other cost reimbursement approaches are less successful, resulting in extra work with limited benefits for the passenger rail agency.

Agreement with the Host Railroad for Operations and Maintenance Cost Support

As well as capital improvements, a state or regional passenger rail agency may agree to provide O&M funds to ensure high-quality service, in addition to the normal payments under Amtrak's operating agreement. A well-known example of this approach is used on the Capitol Corridor in California, where the passenger rail agency funds an additional track maintenance gang and pays a premium for night-time work so that maintenance can be performed outside passenger train service hours. This arrangement avoids much of the need to take track out of service for maintenance during passenger service hours. Track is also maintained to one FRA track class higher than that needed for current operating speeds, to reduce the chance that a track defect will result in a slow order and maintenance-related delays.

As with capital projects, it is critical that the agreement between a passenger rail agency and the host freight railroad specify in detail the obligations of each party to the agreement:

- For the passenger rail agency to pay the agreed-upon fee for the services provided.
- For the host railroad to meet service requirements for the passenger train journey time, number of daily trips, and maximum acceptable delay minutes, following the format shown in Table 4-3.

Agreements between the host railroad and Amtrak and between Amtrak and the passenger rail agency must reference the same service parameters.

On more complex corridors, operations simulations will likely be needed to demonstrate that the agreed-upon service performance is feasible with the proposed O&M practices and to give all parties confidence to enter into the agreements.

4.4 Commuter Service (Non-Amtrak Intercity)

4.4.1 Basic Structure of a Commuter Rail Service on Shared Track

The primary difference between commuter and Amtrak intercity service is that with commuter service there is no entity comparable to Amtrak with access rights and, in many cases, existing agreements with prospective host railroads. The two primary scenarios are that the commuter rail agency purchases the ROW from the freight railroad, allowing the railroad to continue to provide freight service under specified conditions, or the commuter rail agency negotiates access to an active freight corridor. A third alternative is to purchase or lease a portion of the existing ROW for an exclusive passenger track parallel to the existing freight line.

Separate from ROW acquisition and access agreements, commuter rail agencies usually contract for O&M services. The primary exceptions are a group of long-established commuter rail agencies in the NEC and in Chicago, which operate services directly. Almost all recently established commuter service has followed this practice—with one exception, all are operated by a contractor. This project focuses on access issues and is not directly concerned with commuter O&M contracts, but such contracts will be described because the commuter rail agency's contract with the operator may contain requirements that must be consistent with the agreement between the commuter rail agency and the host railroad.

Figure 4-3 illustrates the relationships between the host or tenant railroad, the commuter rail agency (which may also be the host if it owns the ROW), and a contract operator.

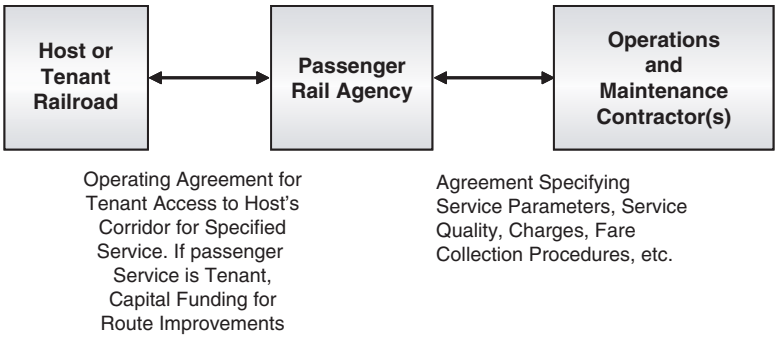


Figure 4-3. Primary contract relationships for commuter service.

The contractual relationships for commuter service differ from those required for an Amtrak-operated intercity service specifically as described:

- Commuter rail agencies often purchase the corridor from a former freight railroad owner. In this case, the former freight railroad usually negotiates an operating agreement to allow continued freight service in the corridor, often with time-of-day and other restrictions.
- If the freight railroad retains ownership of the corridor, the commuter rail agency has to negotiate an operating agreement with the freight railroad. Unlike Amtrak intercity service, the commuter rail agency lacks Amtrak's access rights and must negotiate at arm's length. However, if the parties in a commuter rail access negotiation are unable to reach agreement, they can request non-binding mediation under Section 401 of PRIIA.
- The contract operator's primary relationship is with the commuter rail agency. However, the passenger service operator must comply with any agreements with a host freight railroad concerning passenger rail operations (for example, to maintain safe operations) and for agreed-upon freight operations if the commuter rail agency owns the corridor. These contract provisions are incorporated into the contract operator's agreement with the commuter rail agency. There is no agreement between the contract operator and the host railroad, if the host is not the commuter rail agency. The contract operator simply provides services for the commuter rail agency and must comply with the terms of the agency's agreement with the host railroad.

4.4.2 Inputs to and Preparations for Finalizing Commuter Rail Operating Agreements

The inputs and preparations for finalizing commuter rail operating agreements are generally similar to those for intercity passenger rail service. The major differences are that there is no entity that plays a role similar to Amtrak and that it is much more common for the commuter rail agency to purchase the ROW before initiating service, thereby reversing the relationship between the commuter rail agency and a railroad providing freight service in the corridor.

Long-Term Vision Plan

The commuter rail agency should have a long-term vision plan for the development of railroad services in the state or region. Ideally the plan should include both freight and passenger rail services and have been prepared by the agency in consultation with other state agencies having an interest in transportation, as well as with providers of rail and related services of all types. With regard to passenger service, the plan should describe the long-term goal for passenger rail developments—commuter and intercity—and the principal steps in developing services between the present and the goal. Because all types of rail service often need to operate over shared ROWs, the vision plan will

help ensure that interrelationships between services are considered in advancing plans for individual services and projects. Such consideration is important to minimize the chance that decisions made for one service could limit options for other services.

Feasibility or Planning Study

A detailed plan and feasibility study for the proposed commuter rail service is required, prepared in cooperation with other rail corridor users, such as Amtrak and a freight railroad. As noted previously, some host freight railroads prefer to be deeply involved in feasibility studies to make sure that their concerns are addressed, and others prefer only limited involvement. The feasibility plan differs from the vision plan in that it focuses on the one corridor and service, rather than a whole state or region, but both should be long term, covering a period that reflects the service life of infrastructure investments. Almost all commuter rail projects involve investment in railroad infrastructure, including ROW, track and signal improvements, station and terminal investments, and often purchase or lease of the ROW. These investments have a service life of at least 20 years, and the long-term plan is essential to ensure that benefits from the investments are fully realized.

The feasibility study starts with the goals for the service at each stage in its development, such as:

- Target journey times, station locations, and train departure times.
- Desired number of daily trips.
- Planned accommodations on train.

The results of the study are the actions needed to accomplish the planned service at each development stage, including:

- Approach to obtaining access to the corridor (purchase, long-term lease, permanent easement), as discussed in Section 4.4.3.
- Proposed physical infrastructure investments (track upgrades, sidings and double track, signal systems, etc.). Implementation of infrastructure investments may be staged as patronage grows.
- Estimated cost of infrastructure investments and proposed funding sources.
- Expected service performance—number of trips, station stops, trip time, OTP, and service quality.
- O&M requirements and the associated costs, including where specific maintenance activities are required to ensure planned service quality.
- Passenger car and locomotive requirements, and plans for acquisition and maintenance of suitable equipment for the planned service.

Because there will be considerable uncertainty regarding markets for passenger and freight rail services and the availability of funding for passenger rail capital and operating expenses, the plans must be flexible and structured to respond to unexpected developments. Provision for regular reviews and updates is essential.

The penalties for not planning ahead can be substantial. Focusing on just the short term—thinking "just get the service started and then worry about the long term later"—can lead to missed opportunities. When further development is needed to meet increasing patronage, agencies lacking a basic long-term framework that has been agreed to with other corridor users have found it very difficult or costly to take the next step.

Making Access Agreements and Contracts Detailed, Unambiguous, and Consistent with Long-Term Plans

The agreements between railroads sharing a rail corridor must provide a long-term framework to give all parties assurance that their future business and service development will not be

compromised and that benefits from infrastructure investments can be fully realized. Because the future is inherently unpredictable, the agreements must include a process by which service changes can be negotiated to accommodate changes in performance and traffic levels, within agreed-upon limits. For example, if a long-term commuter rail plan envisions starting only with four peak hour trips per day, increasing frequency and adding off-peak services as demand grows and funding becomes available, then the agreement should reflect that and agree on what investments are required to make service increases possible. If the freight operator wants to assure the availability of a given capacity at different points over the term of the agreement, then the agreement should specify what passenger service levels are consistent with meeting that goal, what investments are needed to make this possible, and how the costs will be shared.

Experience has shown it is unwise to leave some matters for future discussion or agreement or to accept verbal assurances that, for example, additional freight or passenger trains can be accommodated at some point in the future. The negotiators who meet for a later round of discussions are unlikely to be different from those who negotiated the original agreement. Any understandings or assurances that were not explicit in the original agreement will not be enforceable, and changes in personnel, policy, or external circumstances could mean that non-binding assurances have been forgotten or will no longer be honored.

Experience has also shown that the agreements should be highly explicit and cover all aspects of operating needs of corridor users. Lower probability scenarios should be considered and provided for in the agreements, where possible. For example, one commuter rail agency purchased a rail corridor from a freight railroad, which retained trackage rights for freight service on the corridor. Fifteen years later, the commuter authority faced difficulties because the freight railroad wanted to operate more freight trains than either party envisioned when the original agreement was signed. The original agreement lacks any provision to address this situation, thus a broad renegotiation of the agreement is required.

Flexibility, Renegotiation Periods, and Dispute Resolution

All agreements should contain both procedures for periodic revision or renegotiation of contracts and a mechanism to resolve disputes. Given the inherent uncertainties in demand for freight and commuter rail service and in funding availability for passenger rail developments, many agreements provide for renegotiation on request by either party. Other agreements provide for reviews at regular, often 5-year, intervals with provisions for intermediate adjustments where necessary. Several parties commented that shorter intervals tended to produce an inefficient and frustrating state of continuous negotiation. Some contract elements, such as access and maintenance costs, may be subject to annual adjustment based on an agreed-upon cost index.

The STB is not able to resolve disputes over shared commuter rail and freight service. However, under Section 401 of PRIIA, the STB does offer non-binding mediation if the parties are unable to resolve differences on their own. This function of the STB is new, and there is no experience of how the process will work out in practice. Prior to PRIIA, commuter rail shared-corridor agreements usually set out a process for resolving disputes, often ending with submitting the problem to an independent arbitrator when negotiations reach an impasse.

4.4.3 Access Alternatives

Because commuter rail agencies cannot invoke Amtrak's right of access to the U.S. railroad at incremental cost, they have to negotiate access at arm's length with the owner of the rail corridor over which service is planned, essentially purchasing the rail line capacity required for the service. A variety of approaches to accessing capacity have evolved.

Alternative 1: Commuter Rail Agency Purchases Right-of-Way from the Freight Railroad

This approach is commonly used when the commuter rail service expects to be the dominant user of the corridor, and the freight railroad is willing to sell. The commuter authority purchases the ROW and gives the freight railroad long-term or perpetual operating rights to offer defined freight service in the shared corridor. This alternative gives the commuter authority the most control and is strongly preferred where substantial capital investments in infrastructure are required. The commuter authority becomes responsible for track construction and maintenance, signals and train control systems, and dispatching and will typically contract for all these services. The agreement with the freight railroad should specify:

- The geographical limits of the corridor included in the agreement. If a freight railroad is willing to make a sale, it may insist on selling more track than the commuter operator plans to use, so that it is not left with isolated track segments that are expensive and inconvenient to operate.
- Any limits on freight service, such as maximum trains per day, times of day during which freight trains may operate (e.g., avoiding peak commute hours), and action to be taken if the freight operator wishes to increase traffic beyond agreed-upon levels (e.g., how planned and implemented and who is responsible for infrastructure investments where they are necessary, etc.).
- Any size and weight restrictions on freight equipment (e.g., will 286,000 lb or even 315,000 lb freight cars be permitted) and clearances for freight vehicles. This factor can have a significant effect on platform heights and arrangements for ADA access to passenger trains.
- Access fees for freight operations, usually expressed as payments per train- and/or car-mile. The fees should be representative of the equivalent expense a freight railroad would incur to provide comparable service on its own property.
- Liability agreement. Usually, the freight operator will want "but for" protection, as discussed in Chapter 2.
- As with all long-term agreements, provisions to review and renegotiate the agreement as circumstances change and a mechanism to resolve disputes.

Alternative 2: Negotiate Access to a Freight Railroad Corridor

This is the primary alternative for commuter rail agencies where the freight railroad is unwilling to sell, often because the corridor is an important link in that railroad's network and/or carries heavy freight traffic. Because commuter service does not enjoy a right of access comparable to that available to Amtrak intercity service, commuter rail agencies have to pay for the capacity used by the commuter service, distinct from a contribution to infrastructure maintenance, dispatching, and administrative costs. This payment can be made in a number of ways, depending on the situation of the freight railroad corridor before the introduction of commuter service and the railroad's expectations of freight traffic growth:

- An investment in capacity sufficient to fully meet the needs of the passenger service, so that freight service capacity is unaffected at all times of day. This alternative is most likely to be used where freight growth is expected and spare capacity is limited.
- A lump sum payment for long-term or perpetual access for a specified number of trips at a given performance level. Rather than being tied to specific capacity expansion projects, the freight railroad may use the payment anywhere on its system, provided the access agreement is honored. A commuter rail agency may prefer a lump sum agreement that can be funded by a capital grant or bond funding to annual access payments that would have to come from local government funds.
- A per-train-mile or per-car-mile capacity access payment. The amount of the payment can vary widely with local circumstances, including the amount of related investment in the infrastructure using commuter rail agency funds.

- Any combination of the above, either in parallel or sequenced, in a staged project for development of a commuter rail service.

Once the basic approach to securing or paying for the capacity used by the commuter service is agreed on, then the agreement must address the remaining elements, as with Alternative 1. These elements include:

- The geographical limits of the corridor included in the agreement.
- Any limits on freight service, such as times of day during which freight trains may operate (e.g., avoiding peak commute hours).
- Any restrictions on minimum clearances that must be maintained for freight operations (e.g., at station platforms).
- Liability agreement. Usually the freight operator will want "but for" protection as discussed in Chapter 2.
- As with all long-term agreements, provisions to review and renegotiate the agreement as circumstances change and a mechanism to resolve disputes.

Alternative 3: Parallel Operations in a Shared Right-of-Way

This option is similar to Alternative 1 in that the commuter operation purchases or leases its own ROW and becomes responsible for all O&M activities. There is little or no shared operation on the passenger track and only limited interaction with the freight railroad. A substantial capital investment is required to acquire the ROW and to construct the passenger track. This alternative has been used where a high-frequency service is planned and where sufficient space is available in the existing freight railroad ROW for parallel services. This arrangement gives both the passenger and freight operators greater freedom to plan and operate their services independently, using separate dispatchers, but there will still be a number of points of contact that have to be addressed in an agreement. These issues include dealing with points where freight operations cross passenger tracks, joint management of grade crossing systems where highways cross both tracks, coordinating maintenance activities that may constrain operations on a parallel track, and developing communications links among dispatchers for both routine and emergency situations.

4.4.4 Agreement with the Host Freight Railroad

The commuter rail agency planning to access a freight rail corridor (the foregoing Alternative 2) is in a similar position to Amtrak implementing an intercity service. Assuming an approach for paying for capacity has been agreed on, the agreement must specify service parameters (e.g., number of trips, journey time, OTP) and the basis of charges from the freight railroad for infrastructure maintenance, dispatching, and management. If the commuter rail agency owns the corridor, then these matters will be covered in the O&M services agreements described in the next section, and a freight railroad access agreement will be needed as described under Alternative 1.

The specifics of the agreement between the commuter rail agency and the host freight railroad are presented in the following two subsections.

Capital Improvements

Introducing a new high-quality commuter rail service is rarely possible without capital investments in the corridor. Investments are typically needed to increase capacity and to upgrade track and signals to passenger service standards so that the desired service performance can be achieved. Investment funds will be provided by the commuter rail agency to the freight railroad to complete agreed-upon investments in capital improvements.

The agreement will reiterate the service specification, including staged development, where planned. Then, the commuter rail agency and the railroad will agree on the specific improvements

required to support a specified service—number of trips, journey times, and OTP. For a staged development, the agreement will define each stage by the service specification and the corresponding infrastructure improvements. It is essential to link specific improvement projects (1) to specific train frequencies, journey times, and punctuality metrics, properly supported by analysis results from operations simulations and accepted by the host freight railroad and the commuter rail agency, and (2) with defined actions to be taken by the host railroad in the event of non-compliance. The approach illustrated in Table 4-3 is an example of how specific capital improvement should be linked to commuter rail service requirements, including a service specification (number of trips, journey time, station stops, and delay metrics). The agreement must be enforceable. Absent enforceability, there is a serious risk that infrastructure investments will fail to yield the expected benefits.

The commuter rail agency normally contracts with the freight railroad to carry out investment projects. Experience has shown that a fixed-price contract with the railroad for each project, with provision for adjustments for materials prices, is the best approach, giving the railroad flexibility and an incentive to manage the project efficiently. Time-and-materials or other cost reimbursement approaches are less successful, resulting in extra work with limited benefits for the commuter rail agency.

Ongoing Operations and Maintenance Services

As well as capital improvements, the commuter rail agency's agreement with the freight railroad must cover payments of O&M services, normally track and structures maintenance, signal system maintenance, and dispatching. Absent Amtrak's right to be charged for these services at incremental costs, cost-charging calculations will include a component for a share of management, overhead, and capital costs. Additional charges may be agreed upon so that, for example, maintenance can be performed overnight or during specified off-peak hours so as not to interfere with commuter operations. The parties may make use of the kinds of operating and maintenance cost analyses described in Chapter 3 to determine how costs are to be shared.

As with capital projects, it is critical that the agreement between a commuter rail agency and the host freight railroad specifies in detail the obligations of each party to the agreement:

- For the commuter rail agency to pay the agreed-upon fee for the services provided.
- For the host railroad to meet service requirements for the passenger train journey time, number of daily trips, and maximum acceptable delay minutes, following the format shown in Table 4-3.

On more complex corridors, it is likely that operations simulations will be needed to demonstrate that the agreed-upon service performance is feasible with the proposed O&M practices and to give all parties confidence to enter into the agreements.

4.4.5 Operations and Maintenance Services Agreements

Separate from access agreements and associated payments by tenants to host railroads for infrastructure maintenance and dispatching, a commuter rail agency will need to establish contracts for all other O&M services:

- Services on host freight railroad tracks, including:
  - Train operations—provision of engineers, conductors, and other on-train personnel.
  - Equipment maintenance—routine servicing, daily inspection and maintenance, scheduled and emergency equipment inspection and maintenance, and major overhauls.
  - Services at passenger stations and terminal—cleaning, maintenance, ticket sales, etc.

- Additional services on commuter rail agency–owned corridors, including:
  - Dispatching and corridor operations management.
  - Track and structures maintenance.
  - Signal and train control system maintenance.
  - Contracting for major infrastructure projects.

To provide these services, commuter rail agencies can elect to create an operating entity to perform O&M functions or contract out to an independent service provider. In practice, all newly established commuter services have elected to go the contracting route (with one exception), selecting a service provider from among qualified organizations. The exception is the Front Runner commuter service in Salt Lake City, where the Utah Transit Authority chose to operate the service itself, to ensure close control of service and financial performance. (The Utah Transit Authority also operates a light rail system.) Otherwise, only commuter rail agencies taking over an existing service have elected to create an operating subsidiary, usually by taking over staff and management from the former provider. An example is the Northern Indiana Commuter Transportation District, which assumed operating responsibility in 1979 for the service formerly operated by the Chicago South Shore and South Bend Railroad.

The commuter rail agency normally selects a contractor using a conventional bidding process. Commercial firms, Amtrak, or the host railroad may be interested in providing contract O&M services, depending on local circumstances. Some examples of commuter rail agency contracting include:

- The Sounder commuter services in the Seattle area are operated by the host railroad, BNSF. The service operates in part over busy freight corridors, and BNSF preferred to have full control over operations in the corridor. Equipment maintenance is provided by Amtrak, which has a suitable facility in the area.
- In the Boston area, MBTA commuter rail services are operated by the Massachusetts Bay Commuter Railroad Company—a consortium that includes Veolia, a railroad operations contractor, and Bombardier, an equipment manufacturer.
- MARC commuter rail services from Washington, D.C., to Maryland suburbs are operated by the two host railroads—Amtrak for services on the NEC and CSX for services on CSX freight lines.

As is evident from these examples, a commuter rail agency can either contract for all services with one provider (the bundled approach) or let separate contracts for each service, including train operations, car and locomotive maintenance, and track and infrastructure maintenance. Advocates of the unbundled approach believe that the agency can get a lower cost, because there is more competition for each contract. Advocates of a bundled approach believe that one contract is easier to administer than multiple contracts and that better service is obtained when one provider is fully accountable and cannot blame another provider for any service shortcomings.

Typical O&M contracts have a 5-year initial term, renewable for further terms if both parties agree, after which the contract is re-bid. Payment type is typically cost reimbursement with a variety of incentives, both for good service performance (e.g., OTP, aggregate delays, provision of the agreed-upon number of cars on each train and functioning car equipment such as air conditioning and heating, and customer satisfaction) and for cost reductions.

In conclusion, there is no one best approach for obtaining contract O&M services. The path chosen depends on local circumstances, particularly which providers already have operations in the region, the interest level of a host railroad, and the size and complexity of the proposed operations. In all cases, however, the contract should include meaningful incentives both for

high-quality service and for cost savings. The contracts must also allow for periodic cost adjustments to reflect inflation and for the commuter rail agency to adjust service where needed in response to travel demand or budget constraints.

4.5 Managing Change in Agreements

This section discusses approaches to managing the service evolution over time in response to market and financial developments. As discussed in Chapter 5, recommended practice for passenger rail agencies is to negotiate a long-term master access agreement (20 years or more) to give security that a successful service will be able to continue but to arrange for periodic agreement revisions to accommodate changes to both host and tenant services. Likewise, Amtrak maintains operating agreements with all the host railroads, with the ability to modify these agreements to accommodate a new or changed service. In particular, Amtrak can demand that the host railroad accommodate additional trips and raise speeds. However, Amtrak (or a passenger rail agency) must fund track and signal improvements, if required to accommodate the planned changes.

Typical revision procedures for access agreements used by passenger rail agencies and Amtrak for operations on a host freight railroad are presented in the following subsections.

4.5.1 Major Revision to Provide for a Substantial Increment in Capacity and/or Service Performance

This type of revision should take place at intervals of several years, 5 years being a common choice. More frequent revisions can lead to a time-consuming and confusing state of continuous negotiation. The revisions should include changes that all users expect over the period to the next revision, including increases in passenger and freight traffic, capital investments in capacity, measures to reduce journey time, and any associated changes in cost-sharing formulas and agreements. The primary constraint on changes is that they should fall within the scope of the master agreement and long-term plan, unless all parties agree to amend this agreement and plan. The actual changes agreed to in the revisions would be implemented over the period to the next major revision.

Not every service will warrant this level of revision. If services are limited in scope, or do not involve a major capital investment or expansion of service, then a formal revision is not required. In those circumstances, a less sweeping change, as described in the following subsection, is appropriate.

Major revisions are often accompanied by an update to any capacity and cost analysis for the route, especially where the estimates and assumptions concerning traffic levels, track condition, etc., may have become outdated.

4.5.2 Minor Agreement Revisions to Provide a Limited Service Addition or Performance Improvement

A minor revision could be used to implement an additional round trip or a reduction in journey time by a few minutes or to add freight facilities, such as a new industry connection. Operations after the change would still be within the parameters agreed to in the master contract and the most recent major revision. Usually, minor revisions would not trigger any change to cost-sharing formulas agreed upon by host and tenant, or involve significant capital investments. Limited investments may be involved, for projects like adding a passing siding or improving curve geometry to increase speed.

Smaller operations, such as the Downeaster service, may require only minor revisions over time. On that service, either the host or tenant can request a change at any time, which is then negotiated to reach a mutually acceptable resolution within the scope of the long-term access agreement.

4.5.3 Day-to-Day Service Variations

This service level variation falls at the borderline between host–tenant routine contact to maintain service quality and actual planned service changes. Many situations can arise that call for service variations:

- **Planning for special trains for a one-time event.** Most passenger rail agencies prefer to avoid special trains except in the most compelling circumstances. The time and efforts needed to complete arrangements and the potential for disrupting regular service outweigh any benefit. However, the agreement should provide for a right on the part of the passenger rail agency to operate such trains, subject to a test of undue interference with the host's freight operations. There have been instances of a host railroad refusing to consider special trains because the original agreement did not reserve this right.
- **Planning for "regular" special trains,** such as for fans traveling to home games at a sports venue. Several agencies report success with this kind of service. Once the routine is established, the trains are easy to arrange, and schedules are generally known well in advance.
- **Accommodating planned maintenance.** Major maintenance efforts, such as rail, tie, or ballast replacement or a bridge replacement, will necessarily disrupt service. Some maintenance work can be done under traffic, by scheduling the work at night or by scheduling work "windows" between trains, but such scheduling can be inefficient and costly. A preferred approach increasingly used by railroads in the United States and overseas is to close a length of a route completely for several days and conduct a maintenance "blitz" to complete all work in the shortest time possible. For a passenger line, blitzes are typically scheduled at a low-traffic season to minimize service disruption and require careful planning by the agency, host railroad, and operator.

Customary practice is to add these events to the agenda of routine liaison meetings between host, tenant, and contract operators, with additional planning and monitoring meetings as required.

4.5.4 Managing Change with a Passenger Railroad Host and Freight Tenant

Many commuter rail agencies and a few intercity passenger rail agencies have acquired rights-of-way, giving the previous owner long-term or perpetual rights to operate local or through freight service over the line. The trackage rights agreement may restrict freight operations by time of day (to avoid peak commute hours) and cap the total volume of freight traffic. There have been few problems with these arrangements in the past, and only minor revisions have been necessary over time.

However, with growth in freight traffic, freight railroads may seek to expand previously agreed-upon rights and to negotiate for a higher share of capacity in new agreements. In the future, operating agreements may have to allow for the likelihood of increased freight use and set up mechanisms for agreement revisions and investment in capacity expansion. These mechanisms will likely follow the same pattern of periodic major and minor revisions as described previously in the context of a forward-looking long-term plan. State agencies responsible for rail freight matters could be involved.

CHAPTER 5

Ongoing Management of Shared-Use Operations

5.1 Introduction

Although many of the matters related to developing a new or expanded passenger rail service on a shared corridor have to be addressed in the planning, negotiation, and initial implementation stages, the process does not finish with the first revenue trip. In the research for this guidebook, all stakeholders reported that operating a successful service requires ongoing attention to service performance and the maintenance of effective cooperative relationships between all parties responsible for delivering the service, including the host railroad, the operator of the passenger trains (Amtrak or another contractor), and any other contractors involved in delivering the service. Indeed, stakeholders reported that ensuring consistent high-quality service over time is one of the leading challenges for a passenger rail agency.

The challenges arise from a conflict between the needs of users of passenger rail services, especially commuters and riders on corridor-type intercity services, and practical problems of satisfying those needs on a railroad ROW shared with freight service.

The principal user needs relating to operating a shared rail corridor are:

- Reliable service must be provided—most important, the frequency and magnitude of train delays should be within acceptable limits. Practically, reliable service means defining service reliability metrics, monitoring performance as measured by the metrics, and exercising enforcement mechanisms so that all responsible parties can deliver on the required performance.
- Passenger service capacity (seats and other on-board accommodations) is adequate to meet demand.
- Schedules and journey times are appropriate for the kinds of trips taken by users.
- Track condition must be maintained to provide adequate ride comfort, as well as meet safety requirements.

Many other factors bear on the quality of service provided to the user, such as functioning on-board amenities (e.g., HVAC, lighting and toilet systems, cleanliness, food service quality, seating comfort, etc.). However, these factors are usually fully under the control of Amtrak, the passenger rail agency, and the contract operator (if commuter service) and are not affected by the actions of other rail service operators using the corridor.

This section discusses and provides recommendations on how best to ensure that customer needs can be met over time. Specifically, this section will discuss:

- Maintaining service quality, primarily OTP, but also some passenger comfort and amenity issues.

- Managing service evolution over time to adjust for demand growth, faster service, route extensions, and new routes. This includes both short-term and temporary changes in response to special situations and events and longer-term evolutionary change to refine the service and accommodate traffic growth.

Separate discussions are provided for Amtrak intercity services and for commuter services. With Amtrak, the primary access agreements are between Amtrak and the host railroads, and Amtrak's operating agreements govern relationships. Amtrak usually also provides all O&M services for an intercity service, except for infrastructure maintenance and dispatching, which are provided by the host railroad. The sponsoring state or local passenger rail agency does not have hands-on, day-to-day responsibilities. In the case of commuter service, the state or local agency has to work directly with the host railroad, while at the same time managing O&M contractors.

5.2 Setting the Framework and General Points for Ongoing Service Management

Agreements between a state or local government passenger rail agency, Amtrak (if intercity service), a host railroad, and an O&M contractor (if commuter service) have been discussed in Chapter 4. In all cases, the agreements must contain clauses that cover performance monitoring; procedures for resolving service quality problems; and procedures for amending the access agreement to accommodate additional service, reduced journey times, and similar changes, often linked to specific infrastructure investments. A discussion of each of these subjects is provided in the following subsections. Note that while PRIIA gave the FRA and the STB new powers and responsibilities in these areas, these U.S.DOT agencies were still working on detailed procedures for exercising these powers as this Guidebook was being finalized. The requirements in PRIIA and the status of actions by the FRA, Amtrak, and the STB are also summarized in the following paragraphs.

5.2.1 PRIIA Requirements and FRA, STB, and Amtrak Actions on Intercity Passenger Service Quality

In response to frequent complaints and a marked deterioration in Amtrak service quality in recent years, Congress added requirements in PRIIA for setting and enforcing adequate intercity service standards:

- Section 207 of PRIIA is of primary importance; it tasks the FRA with developing performance metrics for intercity passenger rail service, in cooperation with Amtrak and the STB. The FRA published draft metrics early in 2009. In related actions, Amtrak is also advocating application of metrics based on average train delay as described in Section 4.3 as Table 4-3 where service performance as measured by delay statistics is tied to passenger rail agency investments in a rail corridor. In this approach, host railroads are made responsible for corrective action where noncompliance is attributable to the railroad.
- Section 213 states that the STB (1) may investigate service quality on any corridor where OTP is less than 80 percent or is in violation of performance standards established under Section 207 of PRIIA and (2) shall investigate service quality on complaint by Amtrak, a passenger rail agency that funds the service, the host railroad, or another operator on the same corridor. Appropriate penalties can be imposed if the host railroad is found to be responsible for all or some of the delays. The STB has held hearings on the implementation of procedures under this section of PRIIA.

The status of STB and FRA efforts in response to these sections of PRIIA will be evolving over the coming months and years. Passenger rail interests are strongly advised to inform themselves of the current status of these efforts before entering negotiations with Amtrak and host railroads.

The above requirements apply to intercity services as operated by Amtrak. In addition, PRIIA Section 401 empowers the STB to conduct non-binding mediation if a commuter rail agency and a host railroad cannot reach agreement on access terms on their own. This power has been discussed in Section 4.4 of this Guidebook in reference to negotiating and finalizing a basic access agreement. The STB may exercise the same powers if a commuter rail agency and host are unable to reach agreement regarding service additions and other changes.

5.2.2 Performance Monitoring and Service Quality

Service performance can be maintained at a high level only if it is both monitored regularly and arrangements are in place to address cases of unsatisfactory performance. Poor OTP and poor service in other areas can have a substantial adverse effect on ridership. In addition, delays have an adverse impact on operating costs, including additional train crew working hours, provision of substitute transportation if a train has to be terminated short of its destination, and compensation to passengers for missed connections. Recommended practices in each area are discussed in Sections 5.3 and 5.4 for Amtrak intercity and commuter service, respectively. Specific areas of interest include:

- Reporting obligations—what is reported by the host railroad, Amtrak (if involved), and a contract operator (if involved) to the passenger rail agency and between each other. Usually, this includes service performance metrics such as delay minutes, analysis of delay causes and responsibilities, OTP, requirements for special reports on unusual delays and events, and arrangements for communicating information to the public, as required. Agencies responsible for shorter intercity corridors may find that regular Amtrak reporting procedures may not be adequate and will have to establish separate local mechanisms.
- Incentives, penalties, and contractually enforceable standards for OTP (host railroad) and other performance factors (for example, with a contract operator).
- Recommended practices for working with a host railroad to correct persistent poor performance.
- Lines of communication between host railroad, passenger rail agency, O&M contractor, or Amtrak, including arrangements for regular performance review meetings and establishing plans of action to address poor performance.

5.2.3 Agreement Revisions and Updates

As discussed in Chapter 4, recommended practice with respect to access agreements is to execute a long-term (20 years or more) master agreement with Amtrak (if intercity service) or directly with the host railroad (if commuter service). The long-term agreement will guarantee access and specify access terms, but will contain provisions for regular revisions of service details (e.g., number of trips up to a specified maximum, journey times, station stops) and additional infrastructure investments as needed. The agreement gives all users confidence that they can follow their long-term strategic plans for the corridor without risk that their plans will be blocked by an inability to renegotiate the agreement at some point in the future. However, because demand for both freight and passenger service and the availability of funding for service developments are unpredictable, it is also necessary to have flexibility to adjust the agreement within defined limits in response to changing conditions. The agreements should be based on long-term plans and traffic forecasts for each corridor user and should provide security of access for services up to the planned or forecast traffic levels, plus an allowance for additional growth. In almost

all cases, infrastructure investment will be needed over time to accommodate the growth, so the agreement should also define what is needed for each growth increment for each user and responsibility for funding the investment. Within this framework, the agreement should provide for the following types of revisions:

- Major revisions to provide for significant capacity increments and service performance for each user, together with plans for making the accompanying infrastructure investments.
- A procedure for initiating, financing, implementing, and managing capital investments in infrastructure.
- Minor intermediate revisions, such as to add trips up to the threshold that would trigger a major revision or to revise schedules.
- Day-to-day variations in service, such as to accommodate planned maintenance, to accommodate extra trips for special events, or to respond to an unforeseen event.
- Revisions to the payment schedule used to calculate access and O&M charges levied by the host railroad on tenant operators. This revision would normally be used in response to cost inflation for railroad labor and materials, and annual adjustments are the norm. Additional adjustments may be appropriate when an infrastructure investment changes the condition or performance of track or signal systems. For example, an upgrade to allow higher speeds would change what has to be operated, inspected, and maintained, and thus costs.

These contract provisions will be tailored to the needs of the individual services and the concerns of each corridor user.

The following sections describe recommended practices in the area of monitoring service quality, especially OTP. There are large differences between these practices as they relate to Amtrak intercity corridors and to commuter services. Most important, Amtrak's operating agreements with the freight railroads govern service quality issues, including incentive programs, and state passenger rail agencies in the past have had only a limited role. However, the advent of substantial investments by passenger rail agencies in intercity corridors expands the roles of state passenger rail agencies. The state agencies have to negotiate with both Amtrak and the host railroad to ensure that the investments will enable the host railroad to deliver the planned service (e.g., number of trips and journey times) and maintain the specified service quality. In the case of a commuter service, a state or local government agency is the principal in the access agreement with the host railroad and needs to be closely involved in ongoing arrangements for managing service quality.

5.3 Specific Approaches to Managing Amtrak Intercity Services

With a few exceptions, Amtrak monitors service quality and OTP for all its services, whether Amtrak is the host or tenant railroad. Under applicable legal rights, Amtrak pays for access to a host railroad's tracks based on an incremental cost formula. Amtrak is also empowered to include an on-time incentive program in its host railroad agreements, by which Amtrak either imposes penalties for poor performance or provides incentive payments for good performance.

Until recently, Amtrak's operating agreements with host railroads typically contained incentives and penalties based on an "OTP with exceptions" metric, i.e. incentives were based on a route's OTP, with host railroads allowed to claim exceptions in specified circumstances. For example, the agreement may impose penalties if the OTP metric falls below 70 percent and will make incentive payments on a sliding scale if OTP exceeds 80 percent. A train is considered "on time" if it arrives at the terminal station within a specified number of minutes of schedule.

This time allowance is a function of the duration of the train's journey from origin to final destination. This agreement had two shortcomings from the point-of-view of a state agency that sponsors a short intercity corridor:

- The OTP metric and the definition of "on time" may be too loose for the needs of a short-haul corridor that might carry business travelers or commuters, where service quality expectations are high.
- In some cases, the OTP calculation was such that a few poorly performing services or trains resulted in a host railroad maxing out penalties, making it impossible for the railroad to earn incentive payments on remaining services.

These arrangements proved inadequate as freight traffic grew. Concern over the cost of delays prompted Amtrak's move toward host-responsible delay minutes as the preferred and more effective metric, as described in Table 4-3 in Section 4.3. Poor OTP also led to the inclusion of various measures to enforce better OTP in PRIIA, as described previously in Section 5.2.1. In addition, FRA grants are now available under PRIIA and ARRA for projects to relieve railroad congestion and reduce intercity passenger train delays. An agreement to make such an investment can include contractual limits on average delay, as described in Section 4.3.5, to ensure planned benefits are realized. Amtrak is making steady progress in revising the old agreements to reflect new metrics and standards being developed by the FRA and the completion of infrastructure improvements.

Amtrak monitors service performance closely. The host railroads report train location regularly to Amtrak's operations center, although these reports can sometimes be delayed or erratic. To enhance these reports, Amtrak has equipped all locomotives with GPS receivers that report locomotive position in real time. This information is supplemented by conductor event and delay reports, so service problems can be managed in real time and station displays, station staff, and waiting passengers can be advised of train status. The operations center also maintains contacts with host railroad operations centers to resolve problems. The reports also enable Amtrak to compile statistics of train delays and associated causes to monitor host railroad performance against agreed-upon performance standards.

Thanks to PRIIA-required efforts to improve service performance, and more effective metrics and contractual approaches, Amtrak now has more leverage with host railroads to insist on better service performance. However, there are cases where a rail corridor has chronic OTP problems caused by deep-seated operations or infrastructure conditions. In such cases, incentives and penalties may be insufficient to force the host railroad to shift priorities and expend the funds and effort to correct the problems in a timely fashion. However, if the corridor is already well managed and does not have chronic problems, then the incentive can provide the impetus to "go the extra mile."

In the case of chronic problems, Amtrak's practice is to sit down with the railroad to fully diagnose root causes of delays and work out an improvement program that benefits both host and tenant. In one case of persistent excessive delays, the problems were traced to numerous slow orders and interference from track maintenance work. Amtrak agreed to a temporary extension of its schedule, in return for a firm plan from the host railroad to bring the track into a state of good repair over time. This plan allowed Amtrak to return to its original schedule in increments tied to the completion of individual projects. The plan helped the host railroad improve its freight operations as well, providing benefits for both parties.

Some state-supported passenger services have found it beneficial to supplement Amtrak's service quality monitoring and management systems and to be more proactive in diagnosing and correcting OTP problems. Examples are the Capitol Corridor between San Jose and Sacramento,

California, and the Downeaster service between Boston, Massachusetts, and Portland, Maine. The state agencies responsible for these services have invested heavily in track quality and capacity upgrades, and they want to maximize benefit from this investment. Also, both services carry a higher fraction of commuters and business travelers than other non-NEC services and need high service reliability and OTP to meet customer expectations.

Both these sponsoring passenger rail agencies maintain an active staff to help manage the service. Functions performed by these agencies can include:

- Monitoring service performance and identifying and resolving service problems in cooperation with the host railroad and Amtrak.
- Planning and implementing service improvements, including schedule adjustments, station improvements (in cooperation with local communities), cooperative arrangements with connecting and parallel bus services, and route extensions.
- Marketing the service to the public, including a dedicated Web site, advertising, etc.
- Providing real-time service information (e.g., about train delays) via the Web site and other communications channels.
- Providing or funding add-on services, such as food service and on-train hosts.

Amtrak continues to provide the core functions of train operations, equipment maintenance, and the basic access arrangement with the host railroad.

Recommendations for passenger rail agencies that support Amtrak intercity services may be summarized as follows:

- Consistent high service quality can be maintained only by closely monitoring OTP, train delay metrics, and other quality measures and stepping in to help resolve service problems in cooperation with Amtrak and the host railroad.
- Because of its primary operating agreement with the host railroad, Amtrak must lead cooperative efforts to resolve service problems, but it is important for the passenger rail agency sponsoring the service to be at the table to make sure that its concerns are heard and to participate in the solution, where appropriate. If the service sponsor has invested in the corridor (as is often the case), it will have more standing in the discussions and may be able to fund investment to improve service quality or overcome an identified problem.
- Conventional incentive programs for OTP will help add a few percentage points to the performance of an already competently managed operation. However, they do not provide an incentive to correct major operations issues. Where possible, the passenger rail agency, in cooperation with Amtrak, should establish an enforceable service performance agreement where the host railroad is required to correct service problems if performance falls below agreed-upon criteria.

5.4 Specific Approaches to Managing Commuter Services

The general principles behind the recommendations for Amtrak intercity service also apply to commuter services operated over a host freight railroad, suitably adapted to commuter service institutional arrangements. These adaptations recognize the key differences between Amtrak intercity and commuter service:

- There is no equivalent negotiations framework for commuter operations that compares to Amtrak's negotiations framework, and the commuter rail agency must manage all aspects of the host railroad relationship on its own.

- Many commuter services are operated over track owned or leased by the commuter rail agency, and the agency sponsoring the service or its contractor will be responsible for track maintenance and dispatching. Although there may be issues with ensuring good contractor performance, the commuter rail agency is in a position to address problems directly, without the involvement of a host railroad. However, in many cases, commuter agencies have given a freight railroad access to their commuter corridors. In these cases, the freight operator will be the tenant and is likely to have concerns analogous to an intercity passenger service operating on a host freight railroad. Mechanisms to address freight service issues may be needed, such as monitoring performance, identifying problem areas, and taking corrective action in cooperation with the freight service operator.
- Almost all recently established commuter agencies rely on contractors to perform O&M activities, including equipment maintenance and train operations. The contractor responsible for train operations will have day-to-day interaction with a host railroad, and it is essential to ensure that this relationship is constructive. If the commuter rail agency owns or leases the corridor, then infrastructure maintenance and dispatching are added to contractor responsibilities, and the contractor must interact with a tenant freight service operator.

Given this institutional framework, the recommended approaches to managing service quality of commuter operations on a host freight railroad include:

- The commuter rail agency must monitor service quality in real time and be ready to take action in case of a one-time or chronic service problem. In particular, this recommendation requires a clear definition of agency responsibilities vs. those of a train operations contractor regarding communication with the host railroad and the level at which decisions should be referred to the agency.
- The commuter rail agency is normally responsible for public communications on all matters affecting the service, whether a minor short-term emergency (like cancelling a train) or ongoing efforts to resolve a chronic service problem. In these communications, it is critical that the agency not blame problems on other parties or blindside the contractor or host railroad by releasing statements that have not been discussed in advance. Public discussion of disputes among the agency, host railroad, and contractor should be avoided.
- As with Amtrak intercity service, chronic service problems must be addressed cooperatively by the agency, host railroad, and contractor. The goal should be to identify the root causes of the problem and work out solutions that make sense for all parties. Often, it is possible to develop win-win solutions that benefit both freight and passenger operators. Some freight railroads have commented that respecting passenger schedules results in more operating discipline and reduced costs in operating the freight service.
- All commuter agencies establish an incentive program based on OTP or delay metrics. The baseline OTP is usually in the low 90 percent range, with the host railroad and/or contractor earning bonuses for performance above that level. Penalties for low performance should be avoided. As with Amtrak intercity service, these types of incentive schemes add a few percentage points to OTP where the service is already well run but do not help with chronic service problems. It is critical to avoid ambiguity in defining and measuring service performance and deciding which exceptions, if any, are allowed. Also, where contractor and host railroads are jointly responsible for service quality, the commuter rail agency must have a mechanism to resolve disputes as to who was responsible for service problems.

5.5 Case Studies in Service Management

The case studies in Appendix D yielded several good examples of approaches to maintaining high service quality in the face of the inevitable unpredictable events that can disrupt passenger rail service. One example is from the Capital Corridor in Northern California, where the CCJPA has the challenge of operating a high-frequency passenger service on a busy freight corridor. Another is an

approach developed by the BNSF Railway, initially for the METRA commuter services it manages in the Chicago area, but now being applied to all commuter and intercity passenger rail services for which it is the host railroad. The third example is the Downeaster service, where good service quality is maintained on a limited budget by careful attention to detail and maintaining good relationships with all stakeholders. The following summaries provide examples from these case studies.

CASE STUDIES 5

Maintaining Service Quality on a Very Busy Corridor

The portion of the Capital Corridor between Oakland and Sacramento, California, carries 32 one-way passenger trips and about 20 freight trains daily, making it one of the busiest shared corridors in the United States. The CCJPA has adopted a number of strategies to maintain passenger service quality on this corridor, specifically:

- Maintaining track quality at FRA Class 5, one class above that needed for the speeds operated by FRA regulations. This maintenance greatly reduces the chance that a track defect or slow orders will slow passenger operations.
- CCJPA funds an additional year-round track maintenance crew and the additional cost of overnight maintenance activities. This funding allows maintenance to be carried out with minimum interference to daytime passenger operations, and the continuous attention reduces the likelihood of track quality falling below minimum standards.
- Generally, higher track quality and associated infrastructure investments permit higher freight train speeds, reducing differences between freight and passenger average speed and reducing operating interference.

The CCJPA approach is relatively high cost, but it more than pays for itself in additional ridership and revenue attracted by quality service.

CASE STUDIES 6

Using Structured Delay Analysis to Maintain Service Quality

The BNSF Railway is the host railroad for several commuter and intercity passenger rail services. One of these services, a commuter rail line in Chicago, is operated by BNSF under contract to METRA, the Chicago area commuter rail agency. To ensure reliable service, BNSF developed a methodology for structured delay analysis to identify and correct conditions that were preventing reliable service. The approach, an adaptation of a process used by British Rail, involves assigning each delay to 1 of 19 cause categories and researching the root causes of categories resulting in an unacceptable level of accumulated delay. BNSF staff work with the relevant railway departments to develop and implement corrective actions. Where a capital investment is the appropriate response to a delay problem, the analysis provides BNSF with detailed data to support a request for funds. After success in Chicago, BNSF has extended the approach to all passenger services on the BNSF system. The decade of accumulated experience also enables BNSF to offer detailed advice to passenger rail authorities planning new services on exactly what is required to deliver high-quality service.

CASE STUDIES 7

Maintaining Service Quality on a Low-Budget Corridor

NNEPRA is responsible for managing the Downeaster service between Boston, Massachusetts, and Portland, Maine. This service comprises five round trips per day over a relatively short 120-mile corridor. Major capital investments and highly structured analysis processes would be overkill for this corridor. Instead, NNEPRA has evolved an approach that relies on tapping the resources of all stakeholders involved in delivering the service to identify and resolve service problems. NNEPRA staff meets regularly with host railroads, Amtrak, communities that host passenger stations, cooperating bus operators, state transportation officials, advocacy groups, and service vendors (such as on-board food service). Issues identified during these meetings are taken up with the party best placed to take corrective action. In addition, parties that are not directly involved in addressing a problem can be kept advised of what is happening and be reassured that NNEPRA is responding. This is especially important for state officials and advocacy groups. If an investment can be justified, then NNEPRA can take steps to obtain funds. NNEPRA believes it is important to meet regularly with stakeholders, even when there are no pressing matters to discuss. These regular meetings build rapport with the stakeholders so that they are more ready to help when approached with a problem.

Bibliography

This bibliography contains references and very short descriptions of books, papers, reports and other publications that may be useful to Guidebook users. All publications included in this bibliography should be readily available from publishers, databases such as TRIS, or source organizations, either in hard copy or as downloads from the source organizations. Publications that might become rapidly outdated or become unavailable in a short time have been avoided.

This bibliography is not a complete list of references used in preparing the Guidebook, which would have included numerous unpublished or draft reports, papers and meeting presentations, as well as material taken from Web sites of passenger railroads and federal, state, and local government agencies.

This bibliography is organized by subject areas relevant to the issues addressed in the Guidebook or in some cases by the source of material. Within subject areas, items are listed in chronological or alphabetical order, depending on which is judged to be the most helpful to the reader.

Acts of Congress (reverse chronological order)

2009: *American Recovery and Reinvestment Act (ARRA).* Among numerous other provisions, ARRA provided $8 billion in grant funding for intercity high-speed rail, as well as funds for Amtrak and commuter rail.

2008: *Passenger Rail Investment and Improvement Act (PRIIA).* This legislation authorized a 5-year continuation of capital and operations support of Amtrak, added grant programs for conventional and high-speed passenger service, and enacted a number of key policy changes concerning passenger service.

2008: *Rail Safety Improvement Act (RSIA).* This legislation amended or added rail safety regulations in several areas, most notably adding a requirement for installation of PTC on certain routes used by regularly scheduled passenger rail service and specified hazardous materials.

1995: *ICC Termination Act.* This act terminated the Interstate Commerce Commission (ICC) and transferred selected functions to a newly established agency, the Surface Transportation Board (STB).

1981: *Northeast Rail Service Act (NERSA).* Among other provisions, this legislation relieved Consolidated Rail Corporation (Conrail) of all responsibilities for commuter rail service, requiring regional commuter rail agencies to take over operations or contract with Amtrak to operate commuter rail services.

1980: *Staggers Rail Act.* This legislation removed many of the economic regulations applicable to freight railroads related to setting shipping rates, line sales and abandonments, etc., and setting the freight railroad industry on a path to prosperity.

1976: *Railroad Revitalization and Regulatory Reform Act.* This act implemented many of the recommendations of the U.S. Railroad Association for restructuring the northeast U.S. railroad network, including creating the Consolidated Rail Corporation (Conrail) to take ownership of the bankrupt freight railroads, transferring the Northeast Corridor to Amtrak, and providing substantial funding for physical improvements.

1973: *Regional Rail Reorganization Act (the 3-R Act).* This act initiated the process of restructuring the Northeast railroads after the PennCentral bankruptcy, by creating the U.S. Railway Association, tasked with developing a long-term restructuring plan.

1970: *Rail Passenger Service Act,* with later amendments. This legislation established Amtrak to manage the U.S. intercity and long-distance passenger rail network.

1934: *Railroad Retirement Act.* This act established the railroad retirement system to provide pensions for retired railroad employees, which, with numerous amendments, has continued to the present day.

1926: *Rail Labor Act (RLA).* With numerous subsequent amendments, this legislation specified how relations between railroad management and the railroad trades union are to be conducted.

Government Accountability Office (GAO) Reports (Reverse chronological order)

The content of GAO Reports is usually obvious from the title, thus notes on the content are omitted from this section of the bibliography.

2009: *High Speed Passenger Rail—Effectively Using Recovery Act Funds for High Speed Rail Projects.* Report GAO-09-786T, June.

2009: *High Speed Passenger Rail—Future Development Will Depend on Addressing Financial and Other Challenges and Establishing a Clear Federal Role.* Report GAO-09-417, March.

2009: *Commuter Rail—Many Factors Influence Liability and Indemnity Provisions and Options Exist to Facilitate Negotiations.* Report GAO-09-282, February.

2006: *Active Commuter Rail Agency Service Contracts.* Letter to Honorable Richard C. Shelby, Chairman, Committee on Banking, Housing and Urban Affairs, United States Senate. Document GAO-06-820R, July.

2005: Testimony before the Subcommittee on Railroads, Committee on Transportation and Infrastructure, House of Representatives. *Amtrak—Acela's Continued Problems Underscore the Importance of Meeting Broader Challenges in Managing Large-Scale Projects.* Report GAO-05-698T, May.

2004: *Commuter Rail—Information and Guidance Could Help Facilitate Commuter and Freight Rail Access Negotiations.* GAO Report GAO-04-240.

Federal Government Regulations and Industry Technical Standards

American Railway Engineering and Maintenance Association (AREMA). *Communications and Signaling Manual* (current edition). This manual contains technical standards for the design, installation and maintenance of railroad signal and train control and communications systems. The manual is regularly modified and updated to reflect changing industry needs and the introduction of new technologies, as well as changes in FRA safety regulations and railroad service needs.

Federal Railroad Administration and Federal Transit Administration: "Joint Statement of Agency Policy Concerning Shared Use of the Tracks of the General Rail System by Conventional Railroads and Light Rail Transit Systems." *Federal Register,* July 10, 2000.

American Railway Engineering and Maintenance Association (AREMA). *Manual for Railway Engineering* (current edition). This manual contains technical standards for the design, installation, inspection and maintenance of railroad track, structures, and electrification systems. The manual is regularly updated to reflect new technologies, materials, and methods, as well as changes in FRA safety regulations and railroad service needs.

Association of American Railroads (AAR). *Manual of Standards and Recommended Practices* (current edition). This manual is primarily concerned with freight railroad cars and locomotives, but some standards are regularly used in specifications for passenger cars and locomotives. Examples are wheels, axles, bearings and couplers. The manual is regularly modified and updated and updates may be automatically distributed to subscribers.

American Public Transportation Association (APTA). *Passenger Rail Equipment Safety Standards (PRESS)* (current edition). This manual contains standards for the design, construction, inspection and maintenance of railroad passenger cars. The manual is regularly updated to reflect new technologies, materials and methods, as well as changes in FRA safety regulations and railroad service needs.

Federal Railroad Administration. *Railroad Safety Regulations* located in 49 CFR Parts 200 to 299. The most important standards for passenger rail interests are Part 213, Track Safety Standards; Part 236, Signal and Train Control System Regulations; and Part 238, Passenger Car Safety Standards. These and other FRA safety regulations relevant to passenger rail operations at both conventional and high speeds are actively being revised and updated in response to provisions in PRIIA and to meet the need for safety regulations for high-speed railroad systems.

49 CFR 243, "FOX High Speed Rail Safety Standards, Proposed Rule," *Federal Register,* December 12, 1997. This "rule of particular applicability" was developed to govern safety on the proposed FOX high-speed train service in Florida. This service was to operate on a dedicated corridor using French TGV technology. It is likely to serve as a model for similar proposed high-speed rail systems in the future.

U.S. Department of Transportation. "Talgo Train operations on U.S. Railroad Corridors." DOT Docket Management System (DMS) Reference FRA-1999-6404. Items 86 and 87. (1999). These docket items document a series and structural and risk analyses to support a waiver application to operate the non-FRA-compliant Talgo on Washington State's Cascades Corridor.

Capacity and Cost Analysis

AECOM. "Cost-Allocation Methods for Commuter, Intercity and Freight Rail Operations on Shared-Use Rail Systems and Corridors," September 2006. Final Report for NCHRP Project 20-65 (Task 12). This project was the predecessor to NCHRP Project 8-64, which produced this Guidebook. It focused specifically on access costs and operating cost sharing.

AECOM. *NCHRP Research Results Digest 313: Cost-Allocation Methods for Commuter, Intercity, and Freight Rail Operations on Shared-Use Rail Systems and Corridors,* February 2007. A summary of the above.

Interstate Commerce Commission. *Costing Methodologies for the Northeast Corridor Commuter: Commuter Service.* Ex Parte 417, February 1983. The decision that established the process for sharing Northeast Corridor operating costs between Amtrak and the commuter rail agencies using the

corridor. This approach gives commuter agencies access to the corridor at incremental cost. This provision was superseded in 2008 by the provisions of Section 212 of PRIIA.

Zeta-Tech. *Estimating Maintenance Costs for Mixed High-Speed Passenger and Freight Railroad Corridors.* Technical Monograph prepared for the FRA Office of Railroad Development (April 2004). Detailed discussion of cost sharing methodologies, using an approach that uses engineering analyses to calculate each user's contribution to track wear and degradation.

Passenger Rail Projects and Project Planning

California DOT: *California Rail Passenger Program Report* 1993/4 – 2002/3. December 1993.

California DOT: *Amtrak 20-Year Plan,* March 2001.

California DOT has published numerous short- and long-term plans and reports, including those previously cited and annual short-term plans for the Pacific Surfliner and San Joaquin corridors as well as periodically-updated strategic plans. The Capitol Corridor Joint Powers Authority [www.capitolcorridor.org (as of 2009)], a separate organization, publishes similar plans for submission to California DOT.

Federal Railroad Administration. *Vision for High Speed Rail in America.* Revised version, May 2009. A contribution to FRA's strategic planning process as required by ARRA. Describes the structure of the emerging FRA funding proposals and grant programs.

Federal Railroad Administration. *Root Causes of Amtrak Train Delays.* Report CR-2008-076, September 2008. A good analysis for persistent delay problems experienced by Amtrak services.

Intercity Passenger Rail Transportation. AASHTO Standing Committee on Rail Transportation Report, 2002.

New Mexico DOT: *Belen to Santa Fe Commuter Rail Project: Project Development History,* October 2009. Very detailed description of the implementation of this service from the initial go-ahead decision to start of service over the complete rail corridor.

Walsh, Joseph M. "A Sound Decision." *Trains Magazine,* November 2009. Description of the development of the Sounder commuter rail service between Tacoma, Seattle, and Everett, Washington.

Washington State DOT: *Long Range Plan for Amtrak Cascades,* February 2006. An example of a thorough long-term plan for a key rail corridor. Like California DOT, Washington State DOT publishes regularly updated short and long-term plans for the Cascades corridor.

Other Shared-Use Issues, Including Liability and Safety

Bing, Alan. 1989. *Railroad Encroachment Study.* Final Report to Metropolitan Atlanta Rapid Transit Authority, April. Detailed study of risks from freight train accidents on corridors shared with rail rapid transit.

Bing, Alan J., Tsai, Thomas, Nelson, David, and Mayville, Ronald A. 2007. "Safety of Noncompliant Passenger Rail Equipment." *Transportation Research Circular E-C112: Joint International Light Rail Conference: A World of Applications and Opportunities, April 9–11, 2006, St. Louis, Missouri.* http://onlinepubs.trb.org/onlinepubs/circulars/ec112.pdf.

Booz Allen Hamilton, Jacobs Edwards & Kelcey, ICF Consulting, and New Jersey Institute of Technology. 2009. *TCRP Report 130: Shared Use of Railroad Infrastructure with Noncompliant Public Transit Vehicles: A Practitioners Guide.*

Federal Transit Administration. 2005. *Sharing of Tracks by Transit and Freight Railroads: Liability and Insurance Issues.* FTA Final Report FTA-TRI-10-2005.1.

Gross, Yehuda and Mortensen, Steve. 2007. "US DOT Summary of the Shared Use Feasibility Study Report." APTA Rail Conference, June.

Phraner, D. 2001. *TCRP Research Results Digest 43: Supplementing and Updating TCRP Report 52: Joint Operation of Light Rail Transit or Diesel Multiple Unit Vehicles with Railroads Issue.*

Phraner, D. 2000a. "Light Rail Sharing Track with Other Rail Modes: How Far Have We Come at the Millennium?" The 8th Joint Conference on Light Rail Transit, Dallas, Texas.

Phraner, D. 2000b. "German Shared Track Experience Independent Supplemental Technical Study Tour Findings" Final Report for TCRP Project J-06, Task 34.

Phraner, D.,[1] Roberts, R.T., Stangas, P.K., Korach, K.A., Shortreed, J.H., and Thompson, G.J. 1999. *TCRP Report* 52: *Joint Operation of Light Rail Transit or Diesel Multiple Unit Vehicles with Railroads.*

Resor, Randolph R. and Hickey, Thomas. 2005. Shared-Use Rail Corridors. A Survey of Current Practice and Recommendations for the Future. American Public Transportation Conference.

Resor, Randolph R. 2003. *Catalog of "Common Use" Railroad Corridors.* FRA Report DOT/FRA/ORD/03/16.

Liu, Ronfang et. al. 2004. *Survey of Transit/Rail Freight Interaction.* Final Report submitted to the New Jersey Department of Transportation.

Ullman, Kenneth B. and Bing, Alan J. 1995. *High Speed Trains in Freight Railroad Corridors: Operations and Safety Considerations.* FRA Report DOT/FRA/ORD-95/05. This report contains a discussion of the capacity impact of introducing high-speed passenger trains on freight rail corridors and actions required to ensure that such operations were safe. The report includes simple operations simulations and accident risk analysis.

Miscellaneous

Amtrak System Timetable. Published twice a year. The summer 2008 edition was consulted for this Guidebook.

Association of American Railroads: *Small Railroads;* published by the AAR's Economics and Finance Department, 1983 and later editions. General description of the shortline and regional railroad industry.

Cambridge Systematics and SYSTRA Consulting Inc. High-Speed Rail: A National Perspective. Final Report prepared for National Passenger Railroad Corporation, December 2008. An overview of Amtrak's current operations and discussions of the possibilities and problems of developing high-speed rail on U.S. corridors. Note report was drafted before passage of PRIIA.

Loving, Rush Jr. *The Men Who Loved Trains.* Indiana University Press, Bloomington, Indiana, 2009. A lively account of people and events involved in the restructuring of the U.S. passenger and freight railroad industries during the period 1970 to 1987.

[1] The series of reports and papers by David Phraner, cited above, provide a detailed discussion of the benefits and problems of operating a light rail service on track shared with conventional freight railroad operations. The reports also describe experience with overseas operations of this type.

National Surface Transportation Policy and Revenue Study Commission. *Transportation for Tomorrow.* December 2007. Comprehensive review of issues associated with all surface transportation in the United States, focused on capacity, state of repair, and funding. See also next citation.

National Surface Transportation Policy and Revenue Study Commission. *Vision for the Future: US Intercity Passenger Rail Network Through 2050.* This is the contribution of the Passenger Rail Working Group of the Commission to the main report *Transportation for Tomorrow.* Contains a good high-level discussion of the potential benefit of and barriers to implementing high-speed rail in the United States.

Perl, Anthony. *New Departures: Rethinking Passenger Rail Policy in the Twenty-first Century.* Published University Press of Kentucky, Lexington, Kentucky, 2002. Discussion of passenger rail policy alternatives for North America, in the light of successful approaches used elsewhere in the world and 21st century transportation, energy, and climate change challenges.

Surface Transportation Board. *A Study of Competition in the US Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition.* Prepared by Laurits R. Christensen and Associates for the STB, November 2008, with later supplements. Focused primarily on rail freight, this report includes an analysis and discussion of reported capacity problems on the U.S. rail network.

Transportation Research Board. "Research Problem Statements on Intercity Passenger Rail." *TRB Circular No. 490,* 1999. Useful checklist of intercity passenger rail research needs at time of publication. The report might help facilitate the development of intercity passenger rail systems by summarizing what research has been done and what remains.

Vantuono, William C. *The Railroad: What it Is, What it Does,* 5th Edition, Simmons-Boardman Books Inc., Omaha, Nebraska, 2008. A general description of North American freight railroading practices in all engineering, mechanical, operations, and commercial areas.

Acronyms

3-R Act	The Regional Rail Reorganization Act of 1973
4-R Act	Railroad Revitalization and Regulatory Reform Act of 1976
AAR	Association of American Railroads
ABS	Automatic Block Signal System
ACE	Altamont Commuter Express
ACS	Automatic Cab Signals
ACSES	Advanced Civil Speed Enforcement System
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ARAA	Amtrak Reform and Accountability Act of 1997
AREMA	American Railway Engineers and Maintenance-of-Way Association
ARRA	American Recovery and Reinvestment Act of 2009
ASME	American Society of Mechanical Engineers
ATC	Automatic Train Control
ATS	Automatic Train Stop
BART	Bay Area Rapid Transit
B&M	Boston and Main Railroad
BNSF	BNSF Railway Company
CCJPA	Capitol Corridor Joint Powers Authority
CFR	Code of Federal Regulations
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CN	Canadian National Rail Service
C of GA	Central of Georgia Railway Co.
Conrail	Consolidated Rail Corporation
CP	Canadian Pacific Railway
CREATE	Chicago Region Environmental and Transportation Efficiency Program
CRP	Cooperative Research Program
CSX	CSX Corporation
CTC	Centralized Traffic Control
CV	Central Vermont Railroad
DMS	Document Management System
DMU	Diesel Multiple Units
DOT	Department of Transportation (states)
EAF	Engineering Adjustment Factors
EC	European Commission
EN	Euro Norms documents
FELA	Federal Employers Liability Act
FFGA	Full Funding Grant Agreement

FHWA	Federal Highway Administration
FOX	Florida Overland eXpress
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
G&A	General and Administrative
GAO	U.S. Government Accountability Office
HOS	Hours of Service
ICC	Interstate Commerce Commission
IEEE	Institute of Electric and Electronics Engineers
JPA	Joint Powers Authorities
KCS	Kansas City Southern Railway Company
LIRR	Long Island Railroad
LRT	Light Rail Transit
MARC	Maryland Area Regional Commuter Train Service
MBTA	Massachusetts Bay Transportation Authority
METRA	Chicago Metropolitan Rail
MNCR	Metro North Commuter Railroad
MOW	Maintenance-of-Way
mph	Miles Per Hour
MTA	New York Metropolitan Transportation Authority
MU	Self-Propelled Multiple Operated Electric Motor Cars
MUTCD	Manual of Uniform Traffic Control Devices
NAP	National Arbitration Panel
NCHRP	National Cooperative Highway Research Program
NCTD	North County Transit District
NEC	Northeast Corridor
NEPA	National Environmental Policy Act
NERSA	Northeast Rail Service Act of 1981
NICTD	Northern Indiana Commuter Transportation District
NIRC	Northern Illinois Railroad Corporation
NJT	New Jersey Transit
NLRA	National Labor Relations Act
NNEPRA	Northern New England Passenger Rail Authority
NPRM	Notice of Proposed Rulemaking
NRC	National Railroad Construction and Maintenance Association
NS	Norfolk Southern Corporation
NTSB	National Transportation Safety Board
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
OTP	On-Time Performance
PCJPB	Peninsula Corridor Joint Powers Board
PIH	Poison Inhalation Hazard
PRA	Passenger Rail Agency (State, Regional or Local)
PRESS	Passenger Rail Equipment Safety Standards
PRIIA	Passenger Rail Investment and Improvement Act of 2008
PTC	Positive Train Control
RCAF	Railroad Cost Adjustment Factor
RCRI	Railroad Cost Recovery Index
REMSA	Railway Engineering-Maintenance Supplier Association
RLA	Railway Labor Act of 1926
ROI	Return on Investment

ROW	Right-of-Way
RR	Railroad
RRA	Railroad Retirement Act
RRIF	Railroad Rehabilitation and Investment Financing
RSAC	Railroad Safety Advisory Council
RSI	Railway Supply Institute
RSIA	Railroad Safety Improvement Act of 2008
RTA	Illinois Rail Transit Authority
RTC	Rail Traffic Controller
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SCRRA	Southern California Regional Rail Authority
SEPTA	Southeastern Pennsylvania Transportation Authority
SFRTA	South Florida Regional Transportation Authority
SJRRC	San Joaquin Regional Rail Committee
STB	Surface Transportation Board
TCRP	Transit Cooperative Research Program
TEM	Association of American Railroad's Train Energy Model
TGV	French Train a Grande Vitesse
TIH	Toxic Inhalation Hazard
TPC	Train Performance Calculator
TRE	Trinity Railway Express
TTC	Transportation Test Center
TTCI	Transportation Technology Center Inc.
UIC	International Union of Railways
UMTA	Urban Mass Transit Administration (later FTA)
UP	Union Pacific Railway
US	United States
U.S.C.	United States Code
USDOT	United States Department of Transportation
USRA	United States Railroad Association
UTA	Utah Transit Authority
VRE	Virginia Railway Express
WSDOT	Washington State Department of Transportation

APPENDIX A

The U.S. Railroad Industry

Contents

A.1 Introduction

The U.S. railroad industry is complex, a somewhat isolated and specialized world that is largely unknown to the public at large. Regular users of rail passenger services may be familiar with Amtrak and their local commuter agency, but will lack familiarity with all that lies behind the provision of those services. As passenger rail services grow, many individuals concerned with implementing and managing those services and projects will encounter the industry for the first time. This appendix has been provided for those individuals as a guide to the industry and its key players.

The specific areas covered in this appendix include:

- Recent U.S. railroad history, showing how the present industry structure has evolved in response to broader changes to transportation services and facilities
- The freight railroads
- The passenger railroads
- Federal agencies concerned with freight and/or passenger railroads
- Industry and professional associations concerned with the railroads
- The railroad supply industry

A.2 Summary of U.S. Railroad History

The present day structure of the U.S. passenger and freight railroad industry and accompanying legal and institutional arrangements are the end products of decades of change in the railroads themselves and in their competitors. Existing intercity and commuter rail services were established in their present form at different points over this period and reflect local and national circumstances in the railroad industry at those times. An understanding of this history and how it has led to the current situation will help passenger authorities develop realistic plans for new services and conduct effective track sharing negotiations with other railroad operators, whose actions and attitudes have been influenced by this history.

For several decades at the end of the 19th and the early 20th centuries, railroads were the nation's largest industry and included some of the largest individual private business in the country. Railroads had a near monopoly of surface transportation over much of the United States, with competition only from navigable waterways and canals. This situation led to a range of industry-specific laws and regulations, as lawmakers attempted to balance the interests of railroads, shippers, railroad employees, and the general public. Government agencies were created to administer these laws, most notably the Interstate Commerce Commission (ICC) established in 1887 by the Interstate Commerce Act to oversee the fairness of railroad rates and the treatment of shippers.

The ICC's powers were feeble at first, but by 1920 those powers had become very broad, controlling most aspects of railroad rates, mergers, and line purchases, sales, and abandonments. Industry associations came into being to represent the industry at these agencies and with the government generally. The engineering and administrative challenges of constructing and operating the national railroad system and providing for movement of a carload of freight over multiple rail systems led to the establishment of several professional and industry associations to improve technical knowledge and to set technical standards for track, cars and locomotives, signals, and operating rules. Finally, the railroad workforce unionized, with relations between management and labor being formalized in the Rail Labor Act of 1926.

This complex and inflexible industry structure was completed just when highway transportation and commercial air service provided the beginnings of competition. The competition became much more severe after World War II, with construction of the interstate highways and turnpikes and the introduction of commercial jet airliners. In spite of the switch from steam to

diesel traction and some regulation of the competition, railroads were unable to adapt to meet the competition, and the industry's financial condition deteriorated. Railroads operating in the northeast United States were especially vulnerable—freight hauls were shorter, they had more loss-making passenger services to support than elsewhere, and highway construction advanced more rapidly.

Apart from a limited change in 1958, which eased the rules for discontinuing passenger services, there was no change in a railroad regulatory and institutional structure that prevented any effective response to truck, automobile, and air competition. In a last-ditch effort to find a solution to their problems, the two dominant northeastern railroads (and historic rivals), the Pennsylvania and New York Central merged into the Penn-Central Railroad (Penn-Central) on February 1, 1968. The two partners hoped that the combined system could make cost savings that would enable the combined business to survive and prosper.

The merger was a disaster. Penn-Central was unable to resolve post-merger operating problems, and ICC regulation and generous labor contracts prevented any meaningful cost savings. As a result, Penn-Central's financial condition deteriorated rapidly, leading to bankruptcy in June 1970. Its dire financial condition was compounded by badly deteriorated physical conditions, chaotic operations, and questionable financial dealings as management had attempted to hide the true state of affairs. Passenger and freight service over a large area of the United States was in danger of collapse. All other significant northeastern railroads fell into bankruptcy at around the same time, compounding the regions transportation problems.

Over the next decade, Congress responded with a series of major legislative actions and funding initiatives designed to preserve passenger and freight rail service in the Northeast and prevent railroads in other regions from following the Northeast into chaos. Legislation was also designed to shift responsibility for passenger service, both intercity and commuter, to the public sector, including transfer of ownership of the principal commuter rail networks and the Northeast Corridor (NEC) to publicly funded entities. The purpose of separating passenger service from the freight carriers was twofold: 1) to take the financial burden of money-losing passenger carriage off the freight railroads, and 2) to preserve passenger service. Although the crisis originated in the Northeast, the resulting legislation changed the railroad industry nationwide:

- The **Rail Passenger Service Act** of 1970 created Amtrak to operate intercity passenger service with (supposedly temporary) federal assistance. In return for relief from the burden of passenger service, the participating railroads were required to transfer passenger locomotives and cars to Amtrak and give Amtrak rights of access to their networks. The railroads also agreed to an avoidable-cost formula for track-use charges. Amtrak started operations nationwide on May 1, 1971. Commuter railroads were considered a state and local responsibility and were not covered by the Amtrak legislation. In any case, commuter rail operations were already receiving limited federal financial assistance through UMTA, which had been established in 1964.
- As Penn-Central struggled to operate in bankruptcy and other northeastern railroads went bankrupt it became clear that the whole northeastern network had to be restructured. The **Regional Rail Reorganization Act (3-R Act)** of 1973 created the United States Railway Association (USRA) to plan and finance the restructuring of a new railroad company, to be called the Consolidated Railroad Corporation, or Conrail. The 3-R act also provided funding to keep northeastern railroads operating and established grant and loan programs to assist railroads in other regions.
- In 1976, the **Railroad Revitalization and Regulatory Reform Act (the 4-R Act)** implemented USRA's plan to create Conrail as a government-owned corporation. Conrail took over the assets and services of Penn-Central, and the other bankrupt northeastern freight carriers were given the option of joining Conrail. Except for the Boston and Maine Railroad, all the bankrupt railroads did join Conrail. Substantial funds were provided to Conrail to offset continued operating

losses and to overcome deferred maintenance. Physical condition and service improved, but financial losses continued because Conrail was unable to downsize the route network under prevailing ICC procedures or obtain relief from burdensome labor contracts. Conrail also continued to bear commuter rail expenses, not all of which were covered by financial support from state and local government agencies.

- The 4-R Act also transferred the NEC to Amtrak, except the sections that had previously been acquired by State agencies in New York, Connecticut, and Massachusetts. Congress provided funds for a NEC Improvement Plan, which included upgraded track and signal systems. Separately, Amtrak received funding for substantial numbers of new passenger cars and electric and diesel locomotives.
- The **Staggers Rail Act** of 1980 finally relieved freight carriers from most, though not all, federal regulation of rail rates and services and simplified the regulatory process associated with railroad mergers, line sales, and abandonments. This legislation finally allowed Conrail and other freight carriers to rationalize their networks, services, and pricing so that they could sustain freight operations on a profitable basis.
- The **Northeast Rail Service Act (NERSA)** of 1981 was the final step to separate passenger and freight services in the northeast, ensuring that Conrail would not bear any burden from the cost of commuter operations. State and local agencies in the Northeast became fully responsible for commuter rail services, in most cases by establishing their own commuter rail operations. These included the Massachusetts Bay Transportation Authority (MBTA) in Boston, Metro North Commuter Railroad in New York, New Jersey Transit (NJT) Rail Operations, and Southeastern Pennsylvania Transportation Authority (SEPTA) in Philadelphia, Pennsylvania.

These measures were successful. After massive downsizing, Conrail prospered and was privatized in 1987 by a public offering of its stock, and the entire rail-freight industry entered a new era of sound financial performance. The commuter agencies also prospered, with new equipment, new routes and ridership growth. Further descriptions of the actions taken to establish these commuter operators can be found in Appendix D.

Outside the Northeast, the only surviving commuter rail operations were in Chicago, Illinois and San Francisco, California. Over time, these were transferred in stages to regional public transportation agencies, which either set up their own operations or contracted for operations and maintenance (O&M) with Amtrak or the freight railroad that formerly operated the service. The passenger authority either assumed ownership of the infrastructure or continued to operate over freight-railroad tracks, depending on local circumstances.

The commuter rail agreements were purely local in nature, and did not include any general rights of access to rail freight networks or generally applicable formulas for cost-sharing. The focus of the participants at the time was to preserve existing commuter services, not to lay the groundwork for future expansion. Therefore, unlike intercity rail services operated by Amtrak, there is no general right of access to the rail network or statutory formula for cost sharing for commuter services.

After the Staggers Act, NERSA, and the privatization of Conrail, there was no major railroad industry legislation until late 2008. Now clearly separated into intercity, commuter, and freight railroads, each industry segment was able to focus on its own market:

- In the years following the Staggers Act, the freight railroads aggressively downsized, merged with each other, closed or sold underutilized lines, dramatically cut costs, and greatly improved their productivity and financial performance. From 1980 to the mid-1990s, there was some growth in rail traffic, mostly because of the growth of massive low-sulfur coal mines in the Powder River Basin in Wyoming. Otherwise, railroads focused on squeezing more profit from

a roughly static volume of traffic. From the mid-1990s, freight railroads began seeing real traffic growth driven by additional increases in coal traffic from the Powder River Basin, rapid growth in intermodal traffic, especially international container traffic entering rail networks at West Coast ports, and a robust economy. The combination of a downsized network and traffic growth on the Class 1 railroads resulted in an increase in traffic density from 9.9 to 16.3 train-miles per route-mile per day (65 percent) over the 20 years from 1987 to 2006, after allowing for the sale of low-density branch lines. This sharp increase led to local congestion problems, aggravated by operating problems following major railroad mergers in the late 1990s. For the first time in decades, mainline rail capacity became scarce and, therefore, valuable. The per-mile net earnings from a freight train far exceeded track-use fees that a passenger operator would typically pay. This created the difficult negotiating environment for passenger rail interests seeking access to the freight network.

- Commuter rail services also entered a period of expansion. The long-established systems experienced traffic growth, and several cities and regions were able to implement entirely new commuter services, aided by "New Starts" funding from the Federal Transit Administration (FTA). Most notably, the Southern California Regional Rail Authority (SCRRA) was established in the Los Angeles area. The SCRRA purchased 200 miles of underutilized rail right-of-way from freight railroads for its initial services. It now operates seven commuter rail routes on 388 route-miles, including its own tracks and by agreement with area freight railroads. New commuter services were also introduced in the Virginia suburbs of Washington, D.C.; Miami/Fort Lauderdale, Florida; Seattle, Washington; Albuquerque, New Mexico; San Diego and San Jose, California; Dallas, Texas; and Nashville, Tennessee. Several other services are in planning.
- Development of Amtrak intercity services between the early 1990s and 2008 was uneven. In the Northeast, a major project to extend electrification from New Haven, Connecticut to Boston, Massachusetts was completed in 1999, followed by the introduction of Acela high-speed train sets in 2000. California has made substantial investments in corridor services, which with the provision of operating support to Amtrak has resulted in large gains in ridership. Elsewhere, smaller scale investment in infrastructure improvements and provision of operating support for corridor services by state agencies in the Midwest, Pacific Northwest, Maine, and elsewhere have allowed additional trips and service improvements on routes in their areas. However, outside the State-supported corridors and the Northeast Corridor, the lack of funding has meant that there has been little service development.

A.3 Freight Railroads

A.3.1 Introduction

Freight railroads own and operate about 97 percent of the railroad route miles in the United States, with the remainder, about 5,000 miles, owned by Amtrak and commuter rail agencies. Freight railroads also provide mostly local freight service over most routes owned by passenger agencies. Freight railroads are customarily divided by size into three categories:

- **Class 1 railroads,** designated by the Surface Transportation Board (STB) as those with freight revenues exceeding $319 million in 2005. The revenue threshold is adjusted annually using the Railroad Cost Adjustment Factor (RCAF). See the Section A.6.1 on the Association of American Railroads (AAR) for an explanation of RCAF. There are 7 Class 1 railroads operating about 96,000 route miles in the United States, and they earn approximately 92 percent of all freight railroad revenue. The number of Class 1 railroads is unlikely to change unless two Class 1 railroads merge with each other, since no smaller railroad has revenues anywhere near the Class 1 threshold.

- **Regional railroads** operate over 350 route miles or have revenue exceeding $40 million, as defined by the AAR. Regional railroads operate approximately 15,000 route miles and earn about 3.5 percent of all freight railroad revenue.
- **Local railroads** are too small to qualify as regional railroads. Local railroads operate approximately 26,000 route miles and earn about 4 percent of all freight railroad revenue.

The following sections provide some details on these freight railroad groups.

A.3.2 Class 1 Railroads

The seven Class 1 railroads are listed in Table A-1 with some key data on their plant equipment and operations.

The four leading railroads, BNSF and UP in the west, and CSX and NS in the east, dominate the railroad industry with more than 90 percent of total U.S. traffic and revenue. All are the products of multiple mergers of predecessor railroads. Out of necessity, the majority of intercity and long-distance Amtrak services operate over track owned by these railroads, under operating agreements that Amtrak maintains with each of them. Each railroad continues to be active in line sales and acquisitions as they seek to build and maintain a network that best meets their business needs. Passenger service interests should be aware that (other than on obvious core routes) it is always a possibility that a freight route may be acquired or sold, and make sure that any passenger service obligations are transferable to a new owner. Because all four railroads host multiple passenger services, each has an official dedicated to coordinating Amtrak and commuter passenger services.

Canadian National and Canadian Pacific data in the table only identify their U.S. operations. Both host a number of passenger services and, like the "big four," are familiar with the process involved in hosting passenger operations. The final Class 1, KCS, currently has minimal involvement with passenger service.

Class 1 railroads are obliged to submit detailed reports on traffic, operations, revenue expenses, and capital expenditures to the STB. This information is in the public domain and is easily accessible from the STB or statistical reports compiled and published by AAR.

A.3.3 Regional and Short-Line Railroads

Regional railroads are intermediate sized systems as defined in Section A.3.1, usually comprising one or two main lines and a number of yards and branches. There are about 30 regional railroads in the United States. Regional railroads can be long-standing independents that were

Table A-1. Class 1 railroads operating in the United States (2005 data).

Railroad	U.S. Route Miles	Revenue Ton-Miles (billions)	Freight Revenue ($ millions)	Locomotives in Service
BNSF Railway	32,154	595	12,846	5,751
Canadian National Rail Service (CN)	6,736	54	1,422	716
Canadian Pacific Railway (CP)	3,511	24	687	372
CSX Corporation	21,357	247	7,689	3,601
Kansas City Southern Railway Company (KCS)	3,197	25	800	565
Norfolk Southern Corporation (NS)	21,184	203	8,526	3,655
Union Pacific Railway (UP)	32,426	549	13,545	8,119

Source: Railroad Facts, 2006 Edition

never part of a larger railroad system (e.g., the Florida East Coast Railroad), or formed when one of the major railroads "spun off" an unwanted segment of their network to form an independent system (e.g., the Portland and Western Railroad, formerly owned by BNSF, which now hosts a commuter service). Such spin-offs were common in the 1980s and 1990s as the Class 1 railroads downsized their networks to focus on a core system. Several of the regional railroads formed at that time have since been purchased back by Class 1 railroads as traffic grew and service patterns changed. As a group, regional railroads are the most likely to be purchased by a Class 1 in this way, and any passenger access agreement should ensure that passenger service obligations are transferred in case of a change in ownership.

Short-line or local railroads are names given to railroads that are too small to qualify as regional railroads. There are approximately 500 short lines in the United States and may fall into different categories depending on the nature of the traffic, ownership, or geographical area served. These include:

- *Switching and terminal railroads* provide rail freight service in a compact geographical area, providing connections between the line-haul railroads serving the area as well as between line-haul railroads and shippers and receivers in the area. Switching and terminal railroads are often very busy, with numerous connections to classification yards and industries, a type of operation that is unlikely to mesh well with passenger service requirements. Examples are the Indiana Harbor Belt in the Chicago area and the New Orleans Public Belt Railroad.
- *Single industry railroads* are technically common carriers that can provide service to multiple customers, but are primarily devoted to serving the railroad owners industrial plant(s).
- *Short-line and regional railroad holding companies* own multiple railroads, combining the advantages of a larger firm, such as professional management, access to finance, and bulk purchasing with the flexibility of small local railroad operations. A substantial fraction of short lines and regional railroads belong to holding companies, examples of which are R. J. Corman and the Genesee and Wyoming groups.
- *"Classic" short lines* are independent small businesses often with fewer that 20 employees, operating a branch line. These short lines focus on providing individual service to customers on the route. To survive, they need a good relationship with the connecting line-haul railroad, which will often nurture short lines by providing access to information services for car tracking and similar functions.

Short lines are often good candidates for passenger service. Freight traffic is low, typically one or two round trips per day, and the owner will often be willing to sell the right-of-way to the passenger agency as long as it can retain access for freight service. The downside for passenger operators is that substantial expenditure is usually needed to upgrade track and install a signal and train control system suitable for passenger service.

A.4 Passenger Railroads

A.4.1 Amtrak

Section A.2 provides a brief explanation of the origins of Amtrak in 1970–1971 as a response to the Penn-Central bankruptcy and the losses incurred by freight railroads in operating passenger service. The following section expands on that account, particularly describing the subsequent evolution of Amtrak services.

Upon starting operations on May 1, 1971, Amtrak discontinued a significant portion of the non-commuter rail services that had been operated by the freight railroads, retaining only a DOT-designated route system determined to have the best chance of becoming profitable and which could be supported with the available funding. This became the core Amtrak network that

has evolved over the past 35 years in response to funding limits, business prospects, and direction from Congress and the Administration of the day. Initially, Amtrak took ownership of passenger locomotives and equipment, but all O&M services were provided by the host freight railroads on a cost reimbursement basis. Since the early years, Amtrak gradually transferred these functions from freight to Amtrak employees, so that today only infrastructure maintenance and dispatching are provided by host railroads, with all other functions being provided by Amtrak employees.

The services operated by Amtrak in recent years fall into three distinct groups, each with different histories and characteristics.

The Long-Distance and Intercity Network, Operated by Amtrak without State or Local Support

This is the core Amtrak network that includes all long-distance multi-state routes and shorter corridors that lack state government support. Almost all these services operate over freight railroads under access agreements between Amtrak and the host railroads and most comprise only one or two trains in each direction per day. The services are well patronized, but vulnerable to quality issues stemming from host railroad operational issues, track quality problems and localized freight railroad congestion on certain routes. Amtrak's service quality incentives and penalties have limited influence in many cases, as railroads choose to forego incentives rather than improve service. Amtrak has found that the most effective actions are to nurture a cooperative relationship with the host railroads to develop mutually beneficial plans to mitigate service problems.

The Northeast Corridor between Boston, Massachusetts, and Washington, D.C.

Prior to Amtrak, intercity services on the NEC were operated by the Pennsylvania, New Haven, and then Penn-Central railroads. There was limited government investment in improved equipment for the NEC under the High Speed Ground Transportation Act of 1965, in the form of Metroliner high-speed self-propelled multiple operated electric motor (MU) cars for the south end and tilting United Aircraft Turbo trains for the north end. These initiatives were not technically successful, at least in part because there was no parallel effort to upgrade track. In the 1970s and early 1980s, the federal government and state agencies in New York, Massachusetts, and Connecticut purchased the Corridor in the wake of the Penn-Central and other railroad bankruptcies and invested over $2 billion in infrastructure improvements, concentrated on the southern New York to Washington, D.C. portion. A plan to electrify and upgrade the Northern portion from New Haven, Connecticut to Boston, Massachusetts was not completed at this time because of insufficient funding, but was revived in the 1990s and completed in 1999. Amtrak contributed to the NEC renaissance by purchasing the highly successful AEM7 electric locomotives (based on Swedish Railways RC4 design) and Amfleet cars in the late 1970s and putting the high-speed Acela train sets into service in 2000.

Usage and management of this corridor is complex. Amtrak manages corridor operations over all segments except New Rochelle, New York to New Haven, Connecticut, which is owned by the New York and Connecticut Departments of Transportation (DOT) and operated by Metro North Commuter Railroad (MNCR - a unit of the New York Metropolitan Transportation Authority [MTA]). Commuter services share much of the NEC with Amtrak, as well as generally limited freight service in most areas. Maryland DOT (MARC) and Connecticut DOT services east of New Haven (Shoreline East) commuter services on the NEC are operated by Amtrak, and the remainder by regional commuter rail agencies (SEPTA, NJT, Long Island Railroad (LIRR), MNCR, and MBTA).

The agreements between the parties governing access to the NEC and payments for O&M expenses were worked out as required by federal legislation in the 1970s and early 1980s (the 3-R,

4-R and Northeast Rail Service Acts, as described in Section A.2). Full details governing cost of access to the NEC for commuter operators can be found in a decision of the ICC, Ex Parte No 417 of March 3, 1983. The fairness of these arrangements for the different users and the governance arrangements for the corridor continue to be a subject of debate among the users and State and federal agencies. In addition, the NEC has a growing backlog of investment needs to improve performance and add capacity. Sections 211 and 212 of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) mandated a planning process to bring the NEC into a state of good repair, and established a Northeast Corridor Infrastructure and Operations Commission to plan for ongoing capital investments to improve the capacity and performance of the corridor and to establish new cost-sharing formulas.

State-Supported Corridors

Most of Amtrak's shorter distance and predominantly intrastate corridors receive support from state DOTs, varying from operating costs for additional trains to very substantial capital expenditures on infrastructure improvements and new passenger cars and locomotives. Many of these initiatives contain useful examples for methods of developing intercity passenger rail service and are described in Appendix D. Almost all new or expanded intercity passenger rail services developed using PRIIA and the American Recovery and Reinvestment Act of 2009 (ARRA) funding will fall into this category. Applicable methods and services are discussed at length in the body of this Guidebook.

A.4.2 Commuter Railroads

Commuter railroads typically provide passenger rail service in major metropolitan areas, usually between a city center and outlying suburbs. The most extensive systems are in major U.S. cities, such as Boston, New York, Philadelphia, Washington, D.C., Chicago, and Los Angeles. There is no nationwide organization providing commuter rail services, established procedures for access to the railroad network, or cost sharing between multiple users of a commuter corridor, such as those that exist for Amtrak intercity services. Operating arrangements for each system and often for individual routes within a system have evolved in response to local circumstances.

All commuter rail authorities are state or local agencies established under state law. All are eligible to receive grants for capital expenses under various FTA public transportation grant programs. Grants are used to purchase or rebuild passenger cars and locomotives, for new and rebuilt stations, to construct or upgrade the right-of-way, and related activities. However the FTA does not provide operating funds; all support for day-to-day operations must come from state and local sources. An exception is federal funding from the Congestion Mitigation and Air Quality (CMAQ) Improvement program funds administered by the FTA and Federal Highway Administration (FHWA), which may be available to agencies in air quality non-attainment regions.

As of first quarter 2009, there were 21 commuter rail agencies in the United States, with several others under development. The agencies are listed in Table A-2 with the full title of the agency, the marketing name, and the service area. The table also gives annual passenger-miles (in millions) to give an indication of the size of the operation. Size varies enormously—a range of 1000:1 between the largest agencies (e.g., LIRR or NJT) and the smallest (Music City Star in Nashville, Tennessee). Annual patronage data was not available on three recent startups, in Utah, Oregon, and New Mexico. The service provided varies too: the largest systems provide all-day service over an extensive network, while the smallest services are limited to weekday rush hour service. Note that the list does not include light rail transit services that are operated over shared track, with near-complete separation of freight and passenger services into exclusive time-of-day windows.

Most commuter operations are over tracks owned by the commuter agency, most shared with limited freight services, and in some cases Amtrak service. The principal exceptions to this

Table A-2. Commuter rail agencies in the United States (in service 1st quarter 2009).

Agency Title	Marketing Name	Service Area	Annual Passenger Miles (millions)	State/Parent Agency
Central Puget Sound Regional Transit Authority	Sounder Commuter Rail	Everett–Seattle–Tacoma, WA	53	Washington, Sound Transit
Connecticut DOT	Shore Line East	New Haven–New London, CT	9	Connecticut
Maryland Transit Administration	MARC	Washington, D.C. to Baltimore and western MD	228	Maryland
Massachusetts Bay Transportation Authority (MBTA)	MBTA or "The T"	Greater Boston, MA	791	Massachusetts
MTA Long Island Railroad	MTA Long Island Railroad	Long Island, NY	2,258	New York Metropolitan Transportation Authority
MTA Metro-North Railroad	MTA Metro-North Railroad	New York City, Hudson Valley, Westchester County and New Haven, CT	2,127	
New Jersey Transit Corp, Rail Operations	NJ Transit	All New Jersey	2,281	New Jersey DOT
New Mexico DOT	Rail Runner Express	Belen–Albuquerque–Santa Fe, NM	NA	New Mexico
North County Transit District (NCTD)	Coaster	San Diego–Oceanside, CA	43	California
Northern Indiana Commuter Transportation District (NICTD)	South Shore Line	Chicago, IL–South Bend, IN	119	Indiana and Illinois
Peninsular Corridor Joint Powers Board	Caltrain	San Francisco–San Jose–Gilroy, CA	280	California
Regional Transportation Authority (RTA)	METRA	Greater Chicago, IL	1,719	Illinois
Regional Transportation Authority (RTA)	RTA Music City Star	Nashville to Lebanon, TN	2.4	Tennessee
San Joaquin Regional Rail Commission	Altamont Commuter Express (ACE)	San Jose–Stockton, CA	34	California
South Florida Regional Transportation Authority (SFRTA)	Tri Rail	Miami–Ft. Lauderdale–West Palm Beach, FL	108	Florida
Southeastern Pennsylvania Transportation Authority (SEPTA)	SEPTA Regional Rail	Greater Philadelphia, PA	479	Pennsylvania
Southern California Regional Rail Authority (SCRRA)	Metrolink	Los Angeles Basin, CA	414	California
Tri-County Metropolitan Transportation District	Tri-Met WES (Westside Express Service)	Wilson–Beaverton for connection to Portland's MAX light rail line, OR	NA	Oregon
Trinity Railway Express (TRE)	Trinity Railway Express	Fort Worth and Dallas, TX region	17	Texas, Dallas and Ft. Worth transportation agencies.
Utah Transit Authority (UTA)	Front Runner	Salt Lake City to Ogden, UT	NA	Utah
Virginia Railway Express (VRE)	Virginia Railway Express	Virginia suburbs of Washington, D.C.	103	Virginia

arrangement are lines that carry significant freight traffic or where the freight carrier was not prepared to sell to the commuter agency:

- Several METRA (Chicago area) services are operated on freight railroad tracks owned by UP, BNSF, and CP, with the host railroad operating the trains.
- Sounder Services in Washington State on BNSF-owned corridors.
- A few route segments used by the major East Coast commuter rail agencies, such as NJT, MNCR, and MBTA, and by Metrolink in the Los Angeles, California area.

The majority of commuter rail systems engage contractors to operate and maintain the service. The principal exceptions are the major systems around New York City (LIRR, MNCR, and NJT), SEPTA in Philadelphia, and the Chicago area lines that were inherited from bankrupt freight railroads or railroads that did not want to continue as a contract operator. These exceptions are usually full operating railroad subsidiaries of the parent agency, with their own operations and maintenance facilities and personnel. The remaining commuter rail systems contract for O&M with a freight railroad, Amtrak, or an independent firm, depending on local circumstances. In some cases the principal functions (train operations, car and locomotive maintenance, and infrastructure maintenance) are split between two or three contractors.

A.5 Federal Agencies

A.5.1 Federal Railroad Administration

The Federal Railroad Administration (FRA) is the principal modal agency within U.S.DOT concerned with railroads. Compared with the other modal agencies within U.S.DOT it is a small agency and, until recently, received modest funding for its activities. There are three principal offices within the FRA, excluding legal and internal administration activities such as personnel. These are as listed below, with a brief description of their activities.

Office of Policy and Communications

This is a small office that performs in-house analyses and research concerning the railroad industry as requested by the Administrator and other FRA and U.S.DOT officials. It does not make grants and only occasionally awards contracts to analyze issues of interest.

Office of Railroad Development

This office is one of the two major offices in the FRA with a variety of responsibilities, recently much expanded by PRIIA and ARRA. Before this legislation, the office had the following responsibilities:

- Act as the conduit for Amtrak's annual appropriations and oversee Amtrak's activities as directed by Congress and applicable legislation. Much of the actual work in this area concerned working with Amtrak on major NEC capital projects, and working with the administration of the day and Congress on Amtrak-related initiatives and legislation.
- Manage pre-PRIIA and ARRA grant and loan programs, such as Railroad Rehabilitation and Investment Financing (RRIF) and the Rail Line Relocation grant program (aimed at removing busy rail lines from city centers).
- Manage the FRA's responsibilities relating to National Environmental Policy Act (NEPA) compliance in railroad construction projects.
- Manage the FRA's research and development programs, the bulk of which are concerned with safety research to support the FRA Office of Safety activities.

The Office of Railroad Development now has the added and very large responsibility of administering the funds and grant programs established by PRIIA and ARRA. Tight timeframes have

been established for each stage in implementing these programs, including a policy and vision for intercity passenger rail, grant application procedures and requirements, and award criteria.

Office of Railroad Safety

The Office of Railroad Safety is responsible for developing and enforcing railroad safety statutes, regulations, and standards, maintaining comprehensive railroad accident reporting systems and databases, and conducting safety-related analyses and investigations. The safety regulations and related FRA procedures, such as for obtaining a waiver to specific regulations, are discussed in detail in Appendix C.

A.5.2 Federal Transit Administration

The FTA is responsible for managing the federal government's funds, policies, and programs for urban and rural local mass transportation. Currently, the FTA's responsibilities are defined in the **Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users** (**SAFETEA-LU**) of 2005. The FTA manages a broad range of programs covering all modes of local and regional surface public transportation. The scope of its activities is summarized in the following list:

- Modes of transportation covered include local and regional bus services, light and heavy rail mass transit, commuter rail, commuter ferries, and para-transit systems. The FTA is not concerned with intercity rail transportation, although some shorter-distance Amtrak routes qualified for FTA funding, such as the Boston, Massachusetts to Portland, Maine Downeaster service, the Capitol Corridor in California, and the Philadelphia to Harrisburg service in Pennsylvania.
- The FTA administers a variety of grant programs for planning and capital projects and to purchase or rebuild transit vehicles of all types. However, the FTA does not provide operating support to public transportation agencies. One of these programs, the New Starts grant program, is commonly used to fund part of the cost of building a new commuter rail route or extending an existing route.
- The FTA provides many types of technical assistance to local, regional, and state public transportation agencies, such as for planning, implementing new technologies (such as fare collection systems, customer information systems, implementing intelligent transportation systems), improving safety and security, and others.
- The FTA supports a transit research and demonstration program to encourage the development and application of new technology. Developing alternative-fuel propulsion systems and improving energy efficiency are major elements in the research and demonstration program.

A.5.3 Federal Highway Administration

FHWA involvement with railroad concerns highway traffic safety at rail-highway grade crossings. FHWA provides safety standards for the design of the highway at grade crossings and for crossing warning systems. Specifications for types and placement of crossing warning devices such as gates, lights, and bells are given in the Manual of Uniform Traffic Control Devices (MUTCD). The FRA is responsible for the systems that activate crossing warning devices when a train approaches, and the railroad is responsible for the inspection, monitoring, and maintenance of crossing systems.

FHWA also manages a federal grant program for grade crossing improvements using funds authorized by SAFETEA-LU. Most practitioners know this program as "Section 130 funding," although strictly this title refers to a section in a former surface transportation act, not SAFETEA-LU. Approximately $150–200 million is disbursed to states each year to add or upgrade crossing

warning systems and other crossing safety measures, up to and including crossing closure, consolidation, and grade separation. The FRA, together with other surface transportation modal agencies, has developed crossing risk assessment methods to guide the selection of crossings for safety improvements.

A.5.4 Surface Transportation Board

The STB was founded in 1995 by the ICC Termination Act, which eliminated the ICC and transferred some of its powers and duties to the STB. The bulk of the STB's responsibilities relate to freight railroads and interstate trucking, but it also inherited ICC responsibilities concerning Amtrak's relationship with host railroads, including resolving disputes between Amtrak and a freight carrier over access rights and payments. More generally, the STB is a federal regulatory agency with general jurisdiction over rail carrier transportation, including construction, acquisition, operation, or abandonment. This jurisdiction is exclusive and preempts that of state and local authorities, even when the service or facility is located entirely within one state.

More detail is provided in Section B.2.8 of Appendix B, including the new STB responsibilities defined by PRIIA to conduct non-binding arbitration in disputes between commuter agencies and freight railroads, and to monitor and enforce Amtrak on-time performance standards.

A.5.5 National Transportation Safety Board

The primary function of the National Transportation Safety Board (NTSB) is to investigate serious individual transportation accidents in any mode, including railroad accidents. NTSB is independent of DOT modal agencies and has the authority to investigate serious accidents, determine the probable cause, and make recommendations to prevent similar accidents in the future. To carry out its investigations, NTSB has the authority to access accident sites, to inspect and test all equipment and systems that may have a bearing on the investigation, to obtain relevant records from the railroad operator, and to compel testimony under oath from witnesses. NTSB investigates almost all passenger train accidents that result in a loss of life, as well as other serious passenger and freight train accidents. It also will conduct special studies of a class of accidents where it identifies a systemic safety problem that the industry and responsible government agencies should be aware of and address.

The end result of each investigation is a comprehensive report detailing the investigation, the probable cause of the accidents, and recommendations to the train operators and responsible government agencies that would prevent similar accidents in the future. NTSB has no safety regulatory powers, and it is the responsibility of the railroads and government regulators to implement the recommendations.

A.6 Railroad and Related Industry Associations

A.6.1 Association of American Railroads

The AAR is the industry association for the Class 1 railroads. It performs all the customary industry association functions and provides a number of services essential to the smooth running of an interconnected network industry. These are:

- Representing the interests of the industry in public forums of all kinds, including Congressional hearings, hearings by other government agencies (DOT, STB, etc.), and through public outreach.
- Maintaining and publishing industry statistics, mainly derived from mandatory reports on railroad finances and operations to the STB, and performing economic and statistical analyses

on behalf of the industry. AAR publications are the most convenient and accessible sources of railroad financial and operations data.
- Determining industry policies and practices on matters of common interest, especially on technical issues of interoperability between railroads, such as for data communications, train control communications, freight car and equipment condition, and operating rules.
- AAR has established a subsidiary, Railinc Corporation, to provide data services to the freight railroads, including a national register of freight equipment, nationwide freight car location information, an official register of freight car rental rates, and inter-railroad billing and payment systems. The payment systems are used for sharing freight revenue in compliance with agreed contracts, making car hire and demurrage payments applicable when a freight car is not on the owning railroad's property, making freight car repair payments, and similar functions.
- AAR has established the Transportation Technology Center Inc. (TTCI) to provide a wide range of technology services to railroads worldwide, including:
  - Managing the FRA-owned Transportation Test Center (TTC) in Pueblo, Colorado.
  - Carrying out railroad research and testing for AAR itself (under an industry-financed strategic research program), for various FRA research programs, for individual railroads and railroad suppliers, and contract research and analysis for overseas clients. This includes passenger car analysis and testing, such as tests on prototype cars and locomotives, acceptance tests for car purchasers, and crashworthiness tests for the FRA and the Volpe Center.
  - Maintaining and publishing a comprehensive Manual of Recommended Standards and Practices for freight cars and locomotives. Although mostly devoted to freight equipment, a number of standards are widely used in passenger car specifications, such as for wheels, axles, bearings, and couplers.
  - Maintaining and publishing the railroad industries Interchange Rules, which contain the technical standards that must be met for a rail car to be acceptable for nationwide operation.
  - Providing a quality assurance service to manufacturers of safety-critical freight car components, such as wheels axles, bearings, truck frames, and brakes.

As a freight railroad association, AAR does not formally represent or provide services to passenger railroads, which, except for Amtrak, are not members. However, AAR activities do affect passenger railroads that operate services hosted by freight railroads, in part by setting the tone of the freight railroads' relationships with passenger operators through its policy positions, and in part through the various technical and interoperability standards that govern both passenger and freight operations.

A.6.2 American Public Transportation Association

The American Public Transportation Association (APTA) is the industry association for all modes of local and regional public transportation, including commuter rail. APTA's trade association activities are similar to those performed by AAR on behalf of Class 1 freight railroads—maintaining relationships with Congress and relevant DOT agencies, speaking out on issues of interest to its members, and participating in the formulation of public transportation policy. APTA also organizes regular conferences, publishes industry statistics (derived from transit agency reports to the FTA) and develops and maintains selected industry standards. The standards of most relevance to commuter and intercity passenger rail agencies are the Passenger Rail Equipment Safety Standards (PRESS). These standards, which have been developed over the last several years, add considerable detail to the underlying FRA passenger equipment safety standards and are commonly referenced in passenger car specifications and maintenance manuals. The purpose of the standards is not only to enhance safety but also to introduce a measure of standardization among passenger car designs and details, to simplify the car purchasing process, to reduce capital costs, and to improve the reliability and efficiency of passenger rail operations.

A.6.3 American Association of State Highway and Transportation Officials

The American Association of State Highway and Transportation Officials (AASHTO) supports and represents U.S. state transportation agencies with a very wide range of services and other activities. These activities include both representing state transportation concerns and issues to federal agencies and Congress, advocating for transportation policies and funding responsive to state's concerns, and maintaining a wide range of industry standards for transportation facilities, especially for highways. One of AASHTO's committees, the Standing Committee on Rail Transportation (SCORT) undertakes these activities with regard to rail freight and passenger transportation. SCORT has been growing in prominence in AASHTO with recognition of rail transportation as an important contributor to freight and passenger mobility. An example of recent SCORT activity is to facilitate and provide inputs to the National Rail plan and support the development of state rail plans.

A.6.4 States for Passenger Rail Coalition

States for Passenger Rail Coalition (SPRC) is an organization of state passenger rail officials with a specific interest in implementing and expanding intercity passenger rail services in their states. SPRC's functions are to keep its members fully informed of developments in Congress and Federal agencies that affect intercity passenger rail interests and to advocate for policies and funding supportive of passenger rail developments.

A.6.5 American Railway Engineering and Maintenance-of-Way Association

The American Railway Engineering and Maintenance-of-Way Association (AREMA) is a professional association for individuals interested in all aspects of railroad infrastructure engineering, including railroad track, structures, and signal and train control systems. Membership is drawn from professionals working with railroads, rail transit systems, research and academic institutions, consultants, suppliers, and others. AREMA is the primary developer of industry standards in its areas of interest and publishes two key industry manuals of standards and recommended practices:

- Manual for Railway Engineering
- Communications and Signaling Manual

The manuals are updated annually through the work of about 30 specialist committees and are widely used and referenced in North America and throughout the world for application on freight and passenger railroads and rail transit systems. The Communications and Signals Manual was formerly maintained and published by AAR, but was transferred to AREMA when AAR narrowed its focus to the interests of the Class 1 freight railroads several years ago.

AREMA also holds an annual conference and expo and numerous training seminars, courses, and workshops throughout the year.

A.6.6 Other Trade and Professional Associations

There are a number of trade and professional organizations active in the railroad industry other than those mentioned above. Most are unlikely to be of more than passing interest to officials concerned with planning, implementing, and operating passenger rail services, but it can be useful to know of their existence and the nature of their railroad activities. In most cases,

abundant information about the organizations and activities is available on-line and is easily accessed.

Professional Engineering Associations

Professional engineering associations that hold technical and scientific conferences publish both general interest professional journals and refereed technical papers and hold regular conferences. The associations may also develop and maintain engineering standards and recommended practices relevant to railroad plant and equipment. The principal associations with rail interests include:

- American Society of Civil Engineers
- American Society of Mechanical Engineers
- Institute of Electrical and Electronic Engineers

Railroad Supply Industry Associations

There are four associations that often work closely with each other and which provide typical industry association services for their members. These are:

- National Railroad Construction and Maintenance Association (NRC) for railroad contractors.
- Railway Engineering-Maintenance Supplier Association (REMSA) for suppliers of track maintenance equipment, materials, and services.
- Railway Supply Institute (RSI) for rail rolling stock manufacturers, repair and maintenance contractors, and lessors of rolling stock.
- Railway Systems Suppliers Inc. for suppliers of signal, train control, and communications equipment.

International and Overseas Organizations

The world divides into two camps regarding railroad technical and interoperability standards. North American practice is applied in its home region (United States, Canada, and Mexico) and elsewhere in the world to mainly heavy-haul freight operations. European practice, as originally developed by the International Union of Railways (UIC), is generally used on passenger-oriented systems, especially high-speed routes and commuter rail systems. UIC used to manage the equivalent of AAR's interchange rules, obligatory standards to be met by passenger and freight rail vehicles used in international service over multiple national rail systems. UIC also published numerous recommended practices for rail vehicles, track, and signal systems. In addition, each country and national rail system developed its own technical standards and safety oversight procedures.

In recent years, many of these functions have transferred to European Commission (EC) institutions, as the EC sought to ensure interoperability of rail systems throughout Europe and harmonize national standards into Europe-wide standards. These standards (Euro Norms [EN] documents) cover such issues as rail vehicle crashworthiness and typically cover requirements for light and heavy rail mass transit as well as for main line railways.

From a North American point of view, European standards and practices of most interest are those concerned with the strength and crashworthiness of passenger rail cars. Car buff (end load) strength specified in European standards is approximately half that required in equivalent FRA and APTA PRESS standards, and unmodified European cars would not be permitted to operate in the United States without a waiver. However, the European market for rail passenger cars is far larger that the equivalent North American market, and a number of car and train designs developed by the supply industry for European customers are attractive to U.S. passenger rail authorities. There could be substantial cost, delivery time, and reliability advantages in acquiring proven European designs, but the feasibility of using such vehicles on the U.S. rail system is unproven.

A.7 The Railroad Supply Industry

The U.S. freight and passenger railroad industries are supported by a broad supply industry that can provide everything from complete high-speed rail system to inspection services. For the most part, working with the supply industry to obtain materials and services for a passenger rail project is the responsibility of the professional engineers, contractors, and consultants working on the project details, following customary industry standards and practices. However there are two or three areas where the structure of the industry and the products offered can have higher-level influence on the implementation of new passenger rail services. Some points to bear in mind are:

- There has been a worldwide consolidation of the manufacturers of the most complex railroad products, so that few leading firms dominate. Examples are Bombardier (Canada), Alstom (France), Siemens (Germany), and Kawasaki (Japan) for electric locomotives and self-powered train sets of all types, U.S. firms EMD and General Electric for high-power diesel-electric freight locomotives; and Alstom, Ansaldo STS, and Siemens for signal and train control systems. All these firms have operations worldwide, including in the United States, and offer a full range of products. It would be difficult for serious competitors to emerge, given the technological edge and experience accumulated by these firms.
- There are opportunities for smaller or more specialized firms in slightly less complex or specialized products, such as unpowered passenger cars. Examples include the Talgo tilting trains, and the South Korean firm Rotem that is supplying passenger cars with Crash Energy Management structures to Metrolink and other commuter rail authorities. The U.S. market for passenger rail vehicles is relatively small—typically a few hundred vehicles a year—and is dominated by demand from east coast subway and commuter rail systems, especially around New York. The additional demand for new intercity passenger service equipment plus an aggressive program to replace life-expired Amtrak cars might add 200 to 300 cars per year or about 40 percent to the existing market. Some of this expansion can be accommodated within existing facilities and would perhaps require one or two new assembly shops.
- The Railroad Safety Improvement Act of 2008 mandate for the widespread installation of positive train control (PTC) presents a serious challenge for signal and control system suppliers. Existing products have relatively little service history and will likely need further development to meet performance requirements specified by the FRA and the railroads. In addition, some of these requirements are still being worked out by the FRA. Some of the open questions regarding PTC are listed in Section C.7 of Appendix C. Once all requirements are developed, then the suppliers have to produce and install the systems in quantity. Passenger rail interests need to follow these developments and be on the lookout for events that could affect both existing and emerging passenger rail corridors.

APPENDIX B

U.S. Railroad Legal and Institutional Arrangements

Contents

B.1 Introduction

This appendix provides a description of legal and institutional arrangements that apply to the development and operation of intercity and commuter rail services. Many of these arrangements are regulations or statutes, not subject to negotiation and agreement between stakeholders but rather set ground rules for negotiations and for general railroad operations. Passenger rail officials need a good understanding of these issues when preparing for and conducting shared corridor negotiations to ensure plans and proposals are consistent with applicable requirements.

For several decades at the end of the 19th and beginning of the 20th century, railroads were one of the nation's largest industries and included several of the largest individual private businesses in the country. In addition, they had a near monopoly of surface transportation over much of the United States. This situation led to a range of industry-specific laws and regulations, as lawmakers attempted to balance the interests of railroads, shippers, railroad employees, and the general public. Most of the economic regulations (especially of freight rates and service obligations) were swept away in the efforts to revitalize the railroad industry in the 1970s and 1980s, as described in Appendix A, but many other industry-specific federal laws remain in effect. Likewise, some state laws, such as requiring "full crews" for trains and cabooses on freight trains, became obsolete and have been repealed. However, federal laws concerning labor and management issues remain, and differ markedly from later legislation that applies to other private industries and commerce. There are also numerous railroad safety regulations developed and enforced by the Federal Railroad Administration (FRA), which are regularly updated and enhanced to reduce risks of accidents and injury to employees, passengers, and the public at large. The railroad-specific laws and regulations apply to rail services operated on the general rail system of the United States. With a few exceptions, they do not apply to urban rail transit services operated on dedicated lines that do not connect to the general rail system.

Specific issues discussed in this appendix are:

- Amtrak's powers and duties, especially its right of access to the railroad network and its basis for compensating rail line owners for track use.
- Differences between the intercity and commuter services regarding right of access and compensation of the track owner for track use.
- Compensation for railroad employee injuries.
- Labor relations in the railroad industry.
- Railroad retirement benefits.
- Railroad safety regulations.
- Functions of the Surface Transportation Board (STB) relating to rail passenger services.
- Effects of passenger-related investment on freight railroad finances and taxes.

B.2 Amtrak Powers and Duties

During the late 1960s, intercity rail passenger service in the United States reached the lowest level of the past century. The Transportation Act of 1958 had conferred train discontinuance jurisdiction upon the Interstate Commerce Commission (ICC), and many railroads had used that statute to discontinue large numbers of passenger trains. As connections between trains became more difficult, passenger counts declined, and the Post Office Department gradually diverted profitable mail traffic to air and highway transport. When Penn Central notified the ICC of its intent to discontinue all passenger service west of Harrisburg, Pennsylvania and Buffalo, New York, Congress realized some drastic action was needed to save the remaining intercity rail system from total collapse.

The result was enactment of the Rail Passenger Service Act (84 STAT 1327), which took effect in 1971 but has been amended in many respects since then. Today, the statutory provisions pertaining to Amtrak are codified in various parts of Title 49 of the United States Code (U.S.C.), and references herein to the "Amtrak Statute" refer to various provisions of Title 49.

The statutory language provides for the composition of Amtrak's Board of Directors and enumerates the powers of the corporation. It mandates that Amtrak be subject to numerous federal laws pertaining to railroads, such as the Railroad Retirement Act, the Railway Labor Act, and the Federal Employers' Liability Act. As summarized in the subsequent discussion, the statute confers a series of rights and powers upon Amtrak.

B.2.1 Right of Access

One of Amtrak's most important rights is the ability to use the facilities and services of other railroads on an incremental cost basis as set forth in 49 U.S.C. §24308. That right even extends to the use of commuter railroads and regional transportation authority facilities that had not entered into contracts with Amtrak in 1971. (See *Metropolitan Transportation Auth. et al., v. Interstate Commerce Commission et al.,* 792 F.2d 287, 294 [2d Cir. 1986]). It is a right conferred only upon Amtrak, and it cannot be conveyed to or used by another rail operator.

Briefly stated, Amtrak is empowered to make agreements for use of rail facilities or services; the terms of such agreements include a penalty for untimely performance. If the parties cannot agree, Amtrak may petition the STB for an order: (1) directing that the requested services and/or facilities be provided, and (2) fixing the terms of use and the compensation to be paid by Amtrak. Section 24308(a)(2)(B) requires that quality of service shall be " . . . a major factor when determining whether, and the extent to which, the amount of compensation shall be greater than the incremental costs of using the facilities and providing the services."

Accordingly, Congress has empowered Amtrak to use facilities of other railroads upon payment of the "incremental costs." This was the bargain made with the railroad industry in return for granting relief from the railways' common carrier obligations to provide passenger services. By 1971 nearly all passenger trains were run at a substantial operating deficit; the creation of Amtrak relieved the freight carrier industry of this major financial burden. Any payment above the incremental level must be based on service quality, and most agreements between Amtrak and other railroads provide for incentive and penalty payments for on-time performance (OTP).

Section 24308 specifies that intercity and commuter rail passenger transportation provided by or for Amtrak has preference over freight trains in using any rail line, junction, or crossing except in case of emergency or certain findings by the Secretary of Transportation. Amtrak also is empowered to apply to the Secretary of Transportation for an order directing a rail carrier to allow accelerated speeds on a line as well as to require the operation of additional trains on schedules based on the legally permissible speeds. In such cases, the Secretary is to consider: (1) any possible impairment of the carrier's freight service, and (2) the statutory goal of Amtrak to implement schedules that attain a system-wide average speed of at least 60 miles per hour (mph). Once the Secretary has issued an order for faster speeds or additional trains, the STB is required to fix the compensation payable by Amtrak using the "incremental costs" standard.

One matter that is not entirely clear is whether Amtrak's powers to compel the use of rail facilities on an "avoidable cost" standard could be applied to the operation of *commuter trains* under contract with a public agency. Amtrak has the general authority to operate and make contracts for the operation of intercity and commuter rail passenger transportation. Further, the provisions of Section 24308 authorizing Amtrak to obtain an STB order for use of rail facilities upon payment of incremental costs do not purport to limit the use of such facilities to intercity service.

However, Amtrak has never attempted to exercise these rights on behalf of a commuter rail agency for which it is the contract operator, and such an attempt might be highly contentious.

B.2.2 The Surface Transportation Board View on Allocation of Costs and Liability as Decided for the Boston to Portland Downeaster Service

Amtrak's legal rights to obtain services and the use of facilities recently were tested when Amtrak and the Northern New England Passenger Rail Authority (NNEPRA) desired to reestablish rail passenger service between Boston, Massachusetts and Portland, Maine. Guilford Rail System, owners of the railroad facilities in New Hampshire and Maine, resisted, and Amtrak then applied to the STB for an order to compel the use and fix the compensation. In its decision, the STB resolved many disputes as to what should be considered "incremental costs." (*Application of the National Railroad Passenger Corp. – Springfield Terminal Railway Company, Boston & Maine Corporation and Portland Terminal Company,* STB Finance Docket No. 33381, decided May 28, 1998.) Because this is the most recent case on the subject, it is worthy of detailed analysis. The main issues and their resolution are set forth below:

Liability Costs

A. Amtrak was willing to assume responsibility for injury, death, or property damage incurred by Amtrak employees, passengers (including "meeters and greeters"), Amtrak property and equipment, and grade crossing collisions. It proposed to pay Guilford on the basis of $0.0734 per train mile for the "residual liability" (i.e., damages Guilford might incur for injury/death of trespassers, environmental damage, and injury or death of Guilford employees). The STB pointed out that this rate could not be sustained as it would result in an annual payment of only $17,000, whereas a single incident could cost Guilford far more than that. Therefore, the STB ordered Amtrak to either fully indemnify Guilford for these residual liabilities or obtain appropriate insurance to cover them.
B. Guilford also requested indemnification for punitive damages that might be based on Guilford's gross negligence, recklessness, or wanton or willful misconduct. The STB did not require such indemnification because Guilford, operating under the federal statutory scheme, is required to operate safely, and public policy disfavors requiring one party to be responsible for another's gross negligence.
C. Guilford also requested that Amtrak be required to purchase insurance or security for its obligations (on the grounds of its alleged precarious financial condition) and that any order for access be conditioned upon the enactment of legislation in the three affected states to limit liability in excess of insurance coverage. The STB declined to impose any security requirement and pointed out that Amtrak's statutory right of access cannot be denied by holding Amtrak hostage to legislative initiatives.

Maintenance-of-Way Costs

The parties had agreed that the track should be maintained to FRA Class 4 level but could not agree on the incremental costs. Amtrak proposed to pay an incremental maintenance-of-way (MOW) cost of $0.117 per locomotive and car mile based on an ICC determination in an earlier case involving Conrail. They argued that there would be little need for track maintenance for the first 6–8 years after a $39 million rehabilitation project sponsored by the State of Maine. Guilford proposed that payment based on the difference between actual costs under Amtrak operation and the costs recorded during a historic 2-year period. Concluding that neither party had presented sufficient evidence to enable an accurate estimate of the incremental MOW costs, the STB imposed the Amtrak proposal on an interim basis subject to reopening once the parties have had some experience with Amtrak operation over the line.

Line Rehabilitation Costs

Although the parties had agreed on most of the necessary rehabilitation work, issues remained as to bridge rehabilitation and construction of a bypass track around the freight yard near Portland, Maine. With regard to the bridges, Guilford claimed $21 million worth of work was needed, while Amtrak's evidence showed the work could be performed for $2 million. The STB rejected Guilford's claim because it was founded upon the assumption of greater speeds than Amtrak proposed to operate. The STB also noted that several years earlier, Guilford had made a proposal to operate this very same service at the higher speeds without any bridge rehabilitation.

Amtrak had proposed constructing a 2-mile yard bypass, while Guilford contended that the track needed to be about ¾-mile longer. Based on the facts, the STB decided the 2-mile track would suffice and would not impair the freight operations.

Performance Incentive Payments

Although Guilford had requested some modifications, the STB imposed the normal Amtrak provision that monthly incentives begin when trains are operated 80 percent on time and that penalties become payable in any month that trains are operated less than 70 percent on time. This provision is in effect with nearly every other railroad.

Administrative Costs

The STB agreed with Guilford that Amtrak must assume responsibility for "incremental administrative costs" that the freight carrier might incur because of the passenger train operation. Examples of such costs would be dispatching, accounting, and billing. Because the record did not suggest a methodology to calculate such costs, the STB left this to future negotiations.

Future Incremental Costs

Guilford asked that provision be made for future costs, such as freight service expenses, caused by a passenger train breakdown and costs to enhance facilities that would not be needed in the absence of passenger service. The STB noted that Amtrak had agreed to pay for non-routine services, including those associated with a passenger train breakdown, and that the carrier could petition for reopening of the case to address future disagreements regarding facility capacity.

Indexing

Guilford had proposed that costs be indexed based on the Consumer Price Index for all urban consumers. The STB agreed with Amtrak's proposal to use the Railroad Cost Recovery Index (RCRI), because that is more specifically related to the cost of providing railroad service and has been used to index costs in numerous other Amtrak cases.

Jurisdictional Issues

This subsection of the opinion deals with the STB's powers as well as the need to impose certain conditions requested by the parties for future conduct. In view of the importance of these issues, some discussion of them is warranted. However, readers should note that these STB proceedings predate PRIIA. In particular, the law empowering the Secretary of Transportation to issue orders requiring a host railroad to accommodate an increased number of passenger trains and to require track rehabilitation has been transferred under PRIIA to the STB:

- **Rehabilitation, Maintenance, and Initial Operations.** Guilford argued that the STB lacked authority to require Guilford to upgrade or maintain its line to the level requested by Amtrak or to determine the number of trains Amtrak can initially operate. The basis for this position was that another section of law, 49 U.S.C. §24308(d) and (e), required that the Secretary of Transportation (now the STB) issue any order covering the number of trains to be operated or the maintenance and rehabilitation of the line. The STB rejected these contentions, pointing

out that the cited provisions of law apply only to rehabilitation of or additional trains on a line where *Amtrak already operates service,* not where a new service is being developed. Because commencement of service is dependent upon the rehabilitation work and maintenance to allow passenger train speeds, the STB imposed both as requirements. Regarding maintenance, the STB observed, "Indeed, without a maintenance obligation, a host carrier could circumvent our prescription of access simply by allowing track to degrade."

- **Right to Convey or Lease the Line.** Because the proposal entailed a $39.6 million investment of public funds in the line's rehabilitation, Amtrak asked that Guilford be prohibited from conveying any property interest in it without the approval of Amtrak or the STB. The STB declined to impose this requirement because it already has general jurisdiction over the sale or lease of rail lines. Moreover, Amtrak could, if necessary, use its condemnation power under 49 U.S.C. §24311 (discussed below).

  Guilford also objected to a proposal that would have allowed Amtrak's "successors or assigns" to receive the access rights granted to Amtrak in the case. The STB agreed with Guilford on this point, stating:

  > "We agree that the access rights that the Act allows us to grant to Amtrak belong only to Amtrak and may not be transferred to a third party "successor or assign" unless the Act . . . specifically provides otherwise. We see nothing in the access provisions of the Act that allows us to prescribe access terms for a party other than Amtrak, and our decision may not be construed otherwise."

- **Arbitration.** Because Amtrak's agreements with other freight railroads require that disputes be submitted to arbitration, Amtrak asked that such a requirement be imposed. Guilford opposed this request, and the STB stated that it would resolve any future disputes rather than imposing arbitration.
- **Federal Transit Administration Boilerplate Restrictions.** Amtrak had asked that Guilford be required to comply with certain requirements that normally would be imposed as a condition to the voluntary receipt of grants from the Federal Transit Administration (FTA). The objections related to: (1) a statement that the parties "acknowledge" certain matters, (2) that Guilford agree that the funds it receives will not be used for lobbying, and (3) a requirement that Guilford comply with a host of statutes, U.S. Department of Transportation (U.S.DOT) regulations, and state provisions that otherwise would be inapplicable to the railroad (e.g., state laws and regulations relating to civil rights, employment practices, and environmental matters). The STB agreed with Guilford that its authority is limited to prescribing the facilities and services that host carriers must provide to Amtrak. It held that the law provides no basis for prescribing the uses to which carriers put the specific funds they receive for compensation or to require carriers to observe laws and regulations to which they otherwise would not be subject. Accordingly, any such requirements in FTA Grant Agreements cannot be forced upon the operating railroad.

Although the *Guilford* opinion is a good indication of how similar issues involving other parties would be resolved by the STB, some of the issues were decided based on the absence of proof by one or both parties. If concrete evidence had been presented on those issues, the outcome might have been different.

B.2.3 Prevention of Facility Downgrading

Amtrak also has the power to object to the proposed downgrading of any railroad facility it uses. In such case, the Secretary of Transportation is to determine the "avoidable costs," defined as " . . . those costs the rail carrier may avoid if it does not have to retain or maintain a facility in the condition Amtrak requests." Amtrak is required to pay such costs if it desires to continue maintaining the utility of the facility. See 49 U.S.C. §24309.

B.2.4 Power of Eminent Domain

Amtrak enjoys the right to acquire property interests by eminent domain. Section 24311 empowers Amtrak, *inter alia,* to acquire interests in property necessary for intercity rail passenger transportation. Although property of a rail carrier, a state, political subdivision, or governmental authority is exempt from the general authority, Section 24311 confers specific authority to condemn property interests from rail carriers. This provision authorizes Amtrak to apply to the STB for an order establishing the need of Amtrak for the property interest and requiring conveyance of the property interest on reasonable terms, including just compensation.

The statute requires that such property interest be "necessary for intercity rail passenger transportation." It mandates that the requested conveyance be ordered no later than 120 days after filing unless the STB finds that: (1) the conveyance would impair significantly the ability of the carrier to carry out its common carrier obligations [i.e., impair its freight service], and (2) Amtrak's interests can be adequately protected by acquiring an alternative property interest. Such an interest could be one of a lesser stature, such as a lease, or the fee to some other property. Interestingly, the statute makes no provision for use of this power to acquire property to be used for commuter rail transportation.

Amtrak's eminent domain powers were upheld by the U.S. Supreme Court in another case involving Guilford (*National Railroad Passenger Corp. et al. v. Boston & Maine Corp. et al.,* 503 U.S. 407 [1992]). That case arose when segments of Guilford's line used by the *Montrealer* passenger train fell into such disrepair that some of the line was restricted to a speed of 5 mph. When requests for better maintenance were unsuccessful and Boston and Maine Railroad (B&M) spurned a purchase offer, Amtrak entered into an agreement with the Central Vermont Railroad (CV) pursuant to which Amtrak would condemn a 48.8-mile segment of Guilford trackage between Brattleboro and Windsor, Vermont. Upon acquisition, Amtrak would reconvey the segment to CV, which would maintain it to proper standards and grant Guilford trackage rights to serve its customers. Amtrak would contribute $3.1 million toward the rehabilitation costs with CV funding the balance.

The ICC authorized the condemnation, holding that Amtrak had no alternative route for the *Montrealer* trains and that Guilford would be protected by the proffered trackage rights and would receive just compensation, fixed at $2,373,286. Guilford petitioned for review in the U.S. Court of Appeals for the D.C. Circuit, which held that Amtrak is not authorized to condemn property which it intends to reconvey to another railroad. Therefore, Amtrak's needs could be satisfied by an easement or trackage rights. Shortly thereafter, Congress amended the Amtrak statute to specifically authorize the subsequent conveyance of condemned railroad property. Nevertheless, the D.C. Circuit denied rehearing. While recognizing that the new amendment applied to this case, the Court's majority panel held that Amtrak had not established that the property was "required for intercity rail passenger service."

The U.S. Supreme Court reversed, holding that the Court of Appeals' interpretation would limit Amtrak's condemnation authority to property that was necessary, in the sense of indispensable, to Amtrak's operations. Citing an early case in American jurisprudence, which interpreted the word "necessary" to mean "convenient or useful," the Court found "plausible if not preferable," the ICC's interpretation that Amtrak can find that an acquisition is required when it is a useful and appropriate way to accomplish its goals (*McCulloch v. Maryland,* 4 Wheat. 316 [1819]). Because there was no dispute that Amtrak intended to use the condemned trackage for the *Montrealer* service, the ICC had held such use to be sufficient to satisfy the statutory command that condemned property be "required for intercity rail passenger service." This was held to be a reasonable interpretation.

B.2.5 Limitation on Tort Liability

Several years ago, Congress enacted a limitation on rail passenger transportation liability for personal injury to, or death of, a passenger or damage to a passenger's property. This provision, codified at 49 U.S.C. §28103, applies to any rail passenger operation, including commuter operators, Amtrak, or any rail carrier. The statute limits the aggregate allowable awards to all passengers against all defendants for all claims arising from a single accident or incident up to $200 million. It also authorizes rail passenger service providers to enter into contracts to allocate financial responsibility for claims, and it mandates that Amtrak maintain minimum liability insurance coverage of $200 million. Finally, the statute contains limitations on punitive damages and provides that any such damages shall be included within the $200 million maximum.

This law is relatively new and has yet to be tested in the courts. It could prove valuable in fixing the upward limit of exposure for the specified losses for all regularly scheduled passenger rail operations

B.2.6 Additional Significant Rights

The Amtrak Statute also grants special rights to Amtrak regarding exemption from federal or state regulation of rates, routes, and services, from certain state and local taxes, as well as from state laws regulating the size of train crews, pay periods, or paydays.

B.2.7 Enforcement of the Amtrak Statute

Review of the powers and duties conferred upon Amtrak gives rise to the question of whether a state, municipality, or other aggrieved party can sue: 1) Amtrak for failure to discharge its duties, or 2) a freight railroad for alleged failure to comply with the law (e.g., for giving freight trains preference over Amtrak's passenger trains). For example, who can sue if Amtrak attempts to discontinue a route without following the statutory procedures, or if a rail carrier consistently delays Amtrak's trains by running freight trains ahead of them?

The answer is found in that section of the Amtrak Statute presently codified at 49 U.S.C. §24103. This provides that except for certain employee matters, " . . . only the Attorney General may bring a civil action for equitable relief . . ." when Amtrak or a railroad refuses or neglects to discharge its duties under [the Amtrak Statute], engages in, or adheres to an action, practice or policy inconsistent with the statute or obstructs or interferes with an activity authorized by the statute. A further provision specifies that only the U.S. Attorney General can seek judicial review of any service discontinuance or reduction by Amtrak.

More than 30 years ago, the U.S. Supreme Court passed upon this provision in the case of *National Railroad Passenger Corp. et al. v. National Association of Railroad Passengers,* 414 U.S. 453 (1974). This case arose out of the discontinuance of passenger service by the Central of Georgia Railway Co. (C of GA), a subsidiary of the Southern Railway Company. Although the C of GA entered into an Amtrak agreement, its parent did not. Nevertheless, the C of GA sought to drop its passenger trains, and the National Association of Railroad Passengers commenced a lawsuit in the U.S. District Court for the District of Columbia to enjoin the discontinuance on the grounds that the Amtrak statute precluded the discontinuance, because the parent corporation had not entered into an Amtrak agreement and was continuing to operate its own trains.

The District Court dismissed the action on the grounds that the passenger organization lacked standing in view of the provision that only the Attorney General can seek to enforce the statute. An appeal was taken to the Court of Appeals, which reversed, holding that the plaintiffs had standing

and that the law did not bar an action by a private party who allegedly was aggrieved (See 475 F.2d 325 [D.C. Cir. 1973]).

The U.S. Supreme Court reversed with six justices voting for the majority opinion, one justice concurring, one dissenting, and one not participating. After reviewing the details of the legislative history, the majority concluded that the question of private actions to enforce the law was specifically considered and rejected by the House Committee. The majority also noted that inferring a private right of action could result in a barrage of lawsuits in all judicial districts through which a particular train operates with the possibility of conflicting results and heavy monetary losses while the cases wound their way through the courts. Hence, the court held that the section in question provides for a suit by the U.S. Attorney General as the exclusive remedy.

Justice Brennan concurred in the result. He would have left open the question of whether a private suit for mandamus could be brought against the U.S. Attorney General in the event of his alleged failure to enforce the statute.

Justice Douglas dissented. His opinion pointed out that aggrieved passengers are the most obvious complainants, are in the zone of interests protected by the Amtrak Statute, and that they deserve to be heard. He cited other cases where a grant of jurisdiction to the U.S. Attorney General was not held to deprive individual citizens of standing to sue.

Thorough legal research has failed to find any other decision that would supersede this case. Therefore, this case, decided in 1974, remains the law of the land. Although the specific section of law at issue therein has been recodified, the substantive provisions are nearly identical. Accordingly, in view of what was a 7-1 decision on the issue of "standing to sue," it is abundantly clear that under present law, only the U.S. Attorney General may sue to enforce the rights and obligations imposed by the Amtrak Statute.

In response to further queries on this issue, thorough research indicates that not a single case has been decided under this statute in any federal court subsequent to the Supreme Court's 1974 decision. The research found but one lawsuit against a railroad to enforce Amtrak's priorities over freight service. That case was bought by the Department of Justice (on behalf of Amtrak) against the Southern Pacific Railroad. Because there was no reported opinion, the matter must have been decided out of court.

B.2.8 Additional Surface Transportation Board Powers

The Passenger Rail Investment and Improvement Act of 2008, enacted in October 2008, has given the STB an additional responsibility to monitor Amtrak OTP. If performance falls below the standards specified in Section 207 of the legislation, then the STB may initiate an investigation. If the investigation determines that the host carrier is at fault, then the STB may impose penalties or other relief on that carrier. Further details of this provision are discussed in Section 2.8 of the Guidebook and in Appendix C. As of March 2009, the STB was holding hearings and developing procedures to implement this responsibility.

In addition, the powers formerly exercised by the U.S. Secretary of Transportation to require a host railroad to accommodate additional trains on an existing Amtrak service, and to upgrade track to increase speed were transferred to the STB (per Section 213 of PRIIA)

B.2.9 Summary

Congress has given Amtrak broad powers to use railroad facilities and to have services provided on an "incremental cost" basis. Amtrak also enjoys numerous other powers, including the right of property acquisition by eminent domain, exemption from certain taxes, as well as from federal

and state laws governing rates, routes and services, and numerous others. Federal law also imposes a ceiling on railroad tort liability arising out of a single accident.

Although the statute appears to permit use of Amtrak's rights for commuter rail operations, such power, if it exists, has not been exercised to any great extent. In the event of dispute, allocations of costs and responsibilities between Amtrak and a freight railroad generally would be in accordance with the *Guilford* decision regarding intercity rail passenger service between Boston, Massachusetts and Portland, Maine.

Finally, under present law, only the U.S. Attorney General may bring a lawsuit against Amtrak or a rail carrier for an alleged failure to comply with a provision of the Amtrak Statute.

Of all the rights conferred upon Amtrak, the most significant appears to be the right to have rail services provided on an incremental cost basis, a right which is exclusive to Amtrak. The liability ceiling and related insurance program and the freedom from some federal and nearly all state regulation also are of significance.

B.3 Differences between Commuter and Intercity Service

There is a sharp distinction between intercity passenger rail services operated by Amtrak and non-Amtrak services (usually commuter) in all matters pertaining to passenger rail operations on shared corridors. Amtrak's right of access as discussed in Section B.2 do not apply to non-Amtrak services, greatly affecting access terms and other aspects of the relationship between host and tenant railroads.

In many cases it is obvious whether a service is commuter or intercity, but cases arise particularly on shorter corridors where the distinction is less obvious. In these cases it is important to understand the specific factors that determine whether a given rail passenger operation should be classified as "intercity" or "commuter." Unfortunately, the quest for clear definitions of these services has proved elusive. The primary reason is that the two types of rail service overlap in many respects, especially in the rail corridors of highly populated areas. For example, such intercity services as the *Northeast Corridor, Downeaster, Pacific Surfliner,* and *Capitol Corridor* transport riders who travel regularly along short portions of the route, some of whom utilize reduced fare multiple ride tickets. Likewise, there are "commuter" trains that carry large numbers of "intercity" travelers. Examples of the latter are the Long Island Rail Road service between New York City and Montauk, New York [127 miles] and the combination of New Jersey Transit (NJT) and Southeastern Pennsylvania Transportation Authority (SEPTA) services used by many for economical travel between New York City and Philadelphia, Pennsylvania.

The Amtrak Statute contained a provision that any railroad entering into an agreement with Amtrak could discontinue all its intercity passenger train service effective May 1, 1971. In seeking to define intercity service, Congress provided that:

> "Intercity rail passenger service means all rail passenger service other than (A) commuter and other short-haul service in metropolitan and suburban areas, usually characterized by reduced fare, multiple ride and commutation tickets, and by morning and evening peak period operations; and (B) [auto-ferry service]."

Thus, rather than stating what intercity service *is,* Congress declared what it *is not.* As the May 1, 1971 date for commencement of Amtrak operations neared, the importance of properly labeling each service became critical as any "intercity" train operated by a railroad that had contracted with Amtrak would be discontinued unless Amtrak assumed its operation.

Although the statute did not specify what tribunal should make this determination, the ICC undertook the task in the case of *Penn Central Transp. Co. Discontinuance,* 338 ICC 318 (1971). Therein the commission stated that commuter and other short-haul service would "likely" include some or all of the following criteria:

1. The passenger service is primarily being used by patrons traveling on a regular basis either within a metropolitan area or between a metropolitan area and its suburbs;
2. The service is usually characterized by operations performed at morning and evening peak periods of travel;
3. The service usually honors commutation or multiple-ride tickets at a fare reduced below the ordinary coach fare and carries the majority of its patrons on such a reduced fare basis;
4. The service makes several stops at short intervals either within a zone or along the entire route;
5. The equipment used may consist of little more than ordinary coaches; and
6. The service should not extend more than 100 miles at the most, except in rare instances; although service over shorter distances may not be commuter or short haul within the meaning of the exclusion.

Penn Central's bankruptcy judge referred disputes involving three train services to the ICC for advisory opinions. The services at issue were: (1) New York City and Chatham, New York [127 miles], (2) New York City and Philadelphia, Pennsylvania [91 miles], and (3) Philadelphia and Harrisburg, Pennsylvania [104 miles]. The Commission found the New York to Philadelphia service to be "commuter" based on the shorter distances involved and that many passengers traveled to or from the midpoint of Trenton. Likewise, the Harrisburg service was deemed "commuter" as it was said to really constitute two separate services that went "back-to-back" at Lancaster. The Chatham, New York service was held to be intercity; although its trains had many characteristics of "commuter or other short haul" operations, there was no midpoint with any volume of rider turnover and the 127 mile run was simply too long to be deemed a commuter train.

After receipt of the ICC's advisory opinion, the bankruptcy judge declined to further enjoin the discontinuance of the Chatham trains, and various parties appealed. In an opinion discussing the history of the Amtrak statute and the criteria used by the ICC, the Third Circuit Court of Appeals upheld the district judge's refusal to issue a preliminary injunction (*Matter of Penn Central Transportation Company, et al.,* 457 F.2d 381 [3d Cir., 1972]). Subsequently, the ICC's recommendations were confirmed by the district court, thereby ending the judicial inquiry into the matter (*Matter of Penn Central Transportation Company, Debtor, In re Discontinuance of Intercity Passenger Service,* 370 F. Supp 22 (E.D.PA 1974]).

Based on the confirmation by federal courts, it is reasonable to conclude that the ICC's criteria would be applied to resolve any question as to whether a given service is "intercity" or "commuter or other short haul." Those criteria also would be applied to any proposed new service, based on such matters as length of the operation, distance between stations, types of tickets sold, projected ridership characteristics, and equipment employed. As indicated, some commuter services have characteristics of intercity service and vice versa. The determination would turn on application of the criteria and consideration of the overall objective (i.e., is the operation being planned primarily to transport commuters or long-distance passengers).

It is important to note that the definitions of commuter and intercity passenger rail service used to determine whether a service would enjoy Amtrak's access rights may differ from other definitions. Most importantly, definitions used to establish eligibility for capital grants from FTA grant programs do differ in some respects. However, these definitions have no bearing on right of access to the general railroad system.

B.4 Injured Worker Compensation

Railroad employees are covered by a unique law, Federal Employers' Liability Act (FELA), concerning compensation for on-the-job injuries and occupational health problems. This statute governs the tort liability for injury or death sustained by railroad employees while on duty. It dates from the early 1900s, an era when railroading was a very dangerous occupation and long before the enactment of no-fault workers' compensation laws. FELA is not a "no-fault" law; liability is based on the negligence of the employer railroad, its agents, and employees. Contributory negligence by the injured or deceased employee does not bar recovery but, rather, serves to reduce the damages by the proportion of negligence chargeable to the employee. However, contributory negligence is ignored when the injury results from violation of a federal safety statute or FRA safety regulation. Apart from any cost impacts, a significant disadvantage of FELA is that it sets up an adversarial process between management and the injured employee that can damage employee relations.

Some studies have shown that use of state workers' compensation schemes would be less costly than the often protracted litigation resulting from claims under FELA. In recent years, passenger rail interests such as the American Public Transportation Association (APTA), Amtrak, and others have made efforts to amend, repeal, or exempt certain entities, such as commuter railroads and Amtrak, from FELA. The freight railroads and the Association of American Railroads (AAR) have also expressed interest in replacing FELA in the past, but appear to have lost interest in this issue in recent years. Lacking united industry pressure, there has been no progress with changing FELA, and it still applies to passenger and freight railroads operating on the general railroad system of the United States.

B.5 Labor Relations in the Railroad Industry

Labor relations between trade unions representing railroad employees and management are governed by the Railway Labor Act (RLA), originally passed in 1926 (U.S.C. 1926). This statute governs labor relations between railroads and their employees, and differs in a number of ways from the National Labor Relations Act (NLRA) that governs industrial relations for private-sector employees elsewhere in the economy. Although it often is criticized as being outmoded, the law has served its purpose in maintaining stability and preventing strikes in the railroad and airline industries (Title II of RLA makes the statute also applicable to the airline industry). It guarantees the right of employees to join labor organizations and provides the methodology for recognizing bargaining representatives and the orderly settlement of disputes.

Contracts between railroads and unions do not "expire." Rather, they contain a date after which requests for changes in pay rates, work rules, or working conditions can be served by either party. These are so-called "major disputes," and the requests for change are referred to as "Section 6 notices." No changes can be implemented by either party, and the employees cannot strike until the statutory mechanism has been exhausted. Only then can the carrier impose its requested changes and the union strike if it so chooses.

The law empowers either party to a major dispute to request the services of the National Mediation Board. There follows a lengthy time period (sometimes in excess of 1 year) during which the Board meets with the parties and attempts to bring about a settlement. The Board may proffer arbitration, but either party can refuse. Once the Board is convinced that its mediatory efforts have failed, it will release the parties from mediation, and the parties can resort to self-help 30 days later, unless an emergency board is created. In order to prevent a substantial interruption of interstate commerce, the Board may suggest that the President create an

emergency board to address the matter. If such a board is constituted, it must investigate and make its report in 30 days, and there can be no unilateral self-help until 30 days after the report has been rendered.

As indicated above, the emergency board procedure adds another 60 days to the time frame. But even more time is allowed for disputes between a union and, as the statute states, "a publicly-funded and publicly-operated carrier providing rail commuter service. . . ." In such situations, the following steps are enumerated:

(A) In the event the President does not appoint an emergency board, any party or the Governor of any state served may request the establishment of such a board, and the President is required to appoint one. No change (or strike) can take place until 120 days following the appointment.
(B) Following the 120-day period, any party or the Governor may request appointment of *a second* emergency board. In that event:
  (1) The President must establish a second emergency board;
  (2) Within 30 days after establishment, the parties shall each submit a final settlement offer;
  (3) Thirty days later, the board must report on which offer is the most reasonable;
  (4) No change (or strike) can take place until 60 days after the board has made its final report;
  (5) If the board selects the railroad's final offer as the more reasonable and if the union strikes after the 60-day period, the employees shall not be eligible to collect unemployment insurance benefits; and
  (6) If the board selects the union's offer as the more reasonable, the railroad refuses to accept it and the employees strike after expiration of the 60-day period, the railroad may not obtain any benefits from a program it may have with other carriers to obtain "work stoppage" benefits.

Disputes regarding grievances or the interpretation or application of an agreement are deemed "minor disputes" and are handled through a prescribed arbitration process. Employees cannot strike over such issues. Although the RLA's provisions are cumbersome, for the most part they have succeeded in maintaining a stable labor situation, especially for commuter railroads.

B.6 Railroad Retirement Benefits

Retirement benefits for railroad employees are governed by the Railroad Retirement Act (RRA). The RRA, originally enacted in 1934, provides a retirement benefits scheme that is in effect the railroad industry's version of Social Security plus an occupational pension (U.S.C. 1974). Although the benefits are more generous, the program is more costly both to employers and employees. As with FELA, there have been legislative attempts to modify the statute and to remove certain employees from its scope, but these have not met with success. One reason for the stalemate is that as freight railroads have become more efficient over the years, their employment has drastically declined. Passenger railroads are more labor intensive and have been expanding. Thus, the contributions of the growing number of passenger employees are being used to help pay the retirement benefits of the large number of retirees from the freight railroads.

The RRA in its current form (after major amendments in 1974) provides for two tiers of benefits. One tier provides benefits that are similar to and replace Social Security benefits, including disability and family benefits. The other tier provides benefits similar to a private occupational pension plan. The RRA applies to all employees of railroads and railroad industry associations, except " . . . any street, interurban, or suburban electric railway unless such railway is operating as a part of the general diesel railroad system of transportation. . . ." The STB is empowered to determine whether a particular operation falls within the purview of the exemption.

The Railroad Unemployment Insurance Act is a companion statute that provides a system of unemployment benefits to railroad employees.

B.7 Railroad Safety Laws and Regulations

Over the years, Congress has enacted a series of laws intended to promote safety in all aspects of railroad operations. Examples are the Safety Appliance Act, originally passed in 1893, which required power (air) brakes on freight trains and handholds and steps on railroad cars, and the Hours of Service Act, originally passed in 1907. Both these early laws and many of the current regulations are primarily concerned with railroad employee safety, prompted by the extremely high casualty rate among railroad employees in the late 19th and early 20th centuries. Regulations explicitly concerned with the passenger safety have also been developed in recent years. These safety laws and regulations are codified in Title 49 of the U.S.C., with the detailed regulations published in 49 Code of Federal Regulations (CFR) Parts 200-299. In addition, Memoranda of Agreement between the FRA and the Occupational Safety and Health Administration (OSHA) define the boundaries between the responsibility of OSHA and the FRA regarding employee safety. In general, requirements concerning employee activities on or near moving railroad equipment are covered by FRA regulations, and those away from moving equipment (for example, in maintenance workshops or while working on structures such as bridges) are covered by OSHA regulations.

These safety-related laws and regulations, as stated in Section 20102 of Title 49 of U.S.C., apply to any form of non-highway ground transportation that runs on rails or electromagnetic guideways excepting " . . . rapid transit operations in an urban area that are not connected to the general railroad system of transportation." Thus, all commuter rail and Amtrak operations are covered. Selected regulations are also applicable to urban rail transit operations where conventional rail services and urban transit share tracks and corridors.

Individual states may not adopt or enforce laws or regulations on any subject once the appropriate federal agency (Secretary of Transportation, the FRA, or Department of Homeland Security) has adopted regulations on the subject. However, states are permitted to adopt more stringent safety laws or regulations when: (1) necessary to eliminate or reduce an essentially local hazard; (2) not incompatible with a federal law or regulation; and (3) does not unreasonably burden interstate commerce.

The provisions impose requirements and either mandate or authorize the Secretary of Transportation to promulgate detailed regulations to implement them, and individual regulations can be complex. All passenger operations on shared corridors must comply with FRA regulations regarding to track, signal systems, rolling stock, and operations. If an operator wishes to depart from those regulations, it must obtain a waiver from the FRA Office of Safety. Where appropriate, such as for a new dedicated high-speed route that does not use conventional U.S. railroad technology, the FRA will develop a "Rule of Particular Applicability" in cooperation with the operator that specifies safety requirements for infrastructure, vehicles, and operations.

Appendix C provides details of FRA safety regulations of most importance to passenger operations on shared corridors, including where new or changed regulations will be introduced in response to the Railroad Safety Improvement Act (RSIA) of October 2008.

In addition to the formal federal regulations, there are numerous technical engineering standards applicable to railroad plant and equipment to ensure safe and reliable operation, and interoperability of systems and components throughout the industry. These standards have been developed by professional engineering societies and industry associations such as AAR, APTA, the American Railway Engineering and Maintenance Association (AREMA), the Institute of Electrical and Electronic Engineers (IEEE), and the American Society of Mechanical Engineers (ASME), and are almost universally applied.

B.8 Role of the Surface Transportation Board

The STB is a federal regulatory agency with general jurisdiction over rail carrier transportation, including construction, acquisition, operation, or abandonment. This jurisdiction is exclusive and preempts state and local authority even when the service or facility is located entirely within one state. The STB's creation and jurisdiction are founded upon the ICC Termination Act of 1995, which eliminated the ICC and transferred some of its powers and duties to the STB.

The bulk of the STB's responsibilities relate to freight railroads and interstate trucking, but it also inherited ICC responsibilities concerning Amtrak's relationship with host railroads. These include:

- Resolving disputes over calculating incremental costs for specific routes and operations, including where the STB has ordered that a railroad increase speeds for passenger service. This responsibility rested with the Secretary of Transportation before enactment of PRIIA in 2008.
- Compelling use of a route for intercity passenger trains if the host railroad refuses to cooperate.
- Resolving disputes regarding the necessity for and the cost of rail line improvements to support a given level of freight and passenger service.
- Resolving questions regarding agreements for assigning liability, insurance, and indemnification agreements for intercity passenger service.
- Reviewing and authorizing the condemnation of a rail line under Amtrak's right of eminent domain to acquire a rail line "required for intercity rail service".

Many of the STB's responsibilities were exercised during the lengthy effort to restore passenger services between Boston, Massachusetts and Portland, Maine in the late 1990s. Absent new legislation, these events provide a good indication of how similar questions will be resolved in the future. Appendix A and Section B.2 of this appendix provide a detailed discussion of the STB actions in disputes between Amtrak and Guilford Rail System (the freight railroad) in these matters.

Although the STB's powers with respect to commuter rail service are not entirely clear, this has not proven to be a problem. The statute [49 U.S.C. §10501(c)(2)] specifies that the STB does not have jurisdiction over mass transportation provided by a local governmental authority. However, a subsequent subsection provides that the STB does have jurisdiction over transportation provided by a local governmental authority if certain findings are made. The following section [49 U.S.C. §10502] is significant because it empowers the STB to exempt rail carrier transportation from its jurisdiction upon finding that its oversight is not necessary to carry out the national transportation policy and that the transaction or service is of limited scope.

Accordingly, as a practical matter, local commuter rail operators have little contact with the STB except when the agency is called upon to resolve Amtrak-related matters. The normal procedure is for the sponsors of a proposed commuter rail construction and operation project to petition the STB for exemption from its jurisdiction, and the Board generally has granted such petitions to the extent of its legal authority to do so.

Although the STB has significant responsibilities in disputes relating to Amtrak operations over freight railroads, it did not until recently have any responsibilities and powers to intervene in disputes between a freight railroad and a commuter agency. There are also no statutes relating to commuter rail access to the rail network or concerning access costs that the STB could be tasked with interpreting or enforcing. However, PRIIA of October 2008 gave the STB an important power to assist with the arbitration of disputes between a freight railroad and a commuter rail agency, and also further responsibilities concerning Amtrak cost accounting and enforcing OTP:

- The STB may conduct non-binding arbitration between a rail carrier and a commuter rail or transit authority if the parties are unable to reach agreement for the access and use of freight railroad track for commuter operations or the acquisition of an interest in the carrier's ROW.

- The STB may (and must if requested by Amtrak, the host carrier or a public agency funding a service) investigate poor OTP of Amtrak services (below 80 percent on-time or in violation of applicable agreements), determine causes, and make recommendations of reasonable actions to improve OTP. If the host carrier is at fault, the STB may impose damages or other relief on behalf of Amtrak.
- The STB is to assist Amtrak in developing a standardized methodology for allocating capital and operating costs for state-supported services, and a new formula for allocating costs among users of the Northeast Corridor.

Although these powers and responsibilities are new, and some time will have to pass before it is clear how they will be applied in practice, they should help address some of the more difficult problems faced by agencies implementing new or expanded passenger rail service.

B.9 Effect of Passenger-Related Investment on Freight Railroad Taxes and Financial Performance Measures

This section discusses two technical financial issues that have sometimes arisen when a public authority is making an investment in a freight railroads infrastructure to accommodate passenger service. More general questions of whether a host freight railroad should contribute to the capital investment in recognition of benefits that the freight railroad will receive from the investment (such as reduced maintenance cost or quicker trip times), and ensuring that the passenger agency receives the expected benefits from the investment are discussed in the Guidebook.

In a majority of passenger rail developments, a public agency (state DOT, commuter rail agency, etc.) will make an infrastructure investment on a private railroad to ensure access, and increase line capacity to achieve the desired level of service. The public agency does not usually retain ownership of the investment, except station buildings in some cases. Instead, the investment is transferred to railroad ownership as part of the payment for access to freight railroad tracks and for the level of service (i.e., speeds, train frequency, OTP) specified in the access agreements.

In this case, the freight railroad becomes the owner of the infrastructure assets purchased with public funds and will include the value of the assets in its financial reporting. This has a number of consequences that may affect the commercial railroads' willingness to accept public investments, specifically:

- The asset would be subject to property taxes levied by state and local government entities (counties, towns, and cities). In a number of cases the passenger rail agency agrees to compensate the freight railroad for property taxes as part of its ongoing operations and maintenance payments. Different formulas are used depending on the individual state's tax structure. While state tax impacts do not seem to be a major problem, there have been instances of a railroad refusing to participate in a passenger-related investment for this reason. Clearly, tax impacts must be considered and railroad concerns addressed in negotiations. In some cases, rail passenger agencies have included payments to offset these increased taxes in annual access fees.
- The asset becomes part of the denominator used in Return on Investment (ROI) calculations in financial analysis and reporting. Generally, the railroad will not receive any return on the public investment, which is made by a public agency for a public purpose. As a result, the public investment dilutes (reduces) the railroad's apparent ROI. This could have a significant impact on the railroads' financial situation. ROI measures are typically used by the investment community in assessing the financial strength of the railroad, in valuing share prices, and in the STB assessments of revenue adequacy.

To date, the impact of passenger-related investment on ROI has not been a major issue, mainly because public investments have not been large enough to distort ROI. With the potential for

increasing investment in the future, the issue may become more significant and may require consideration of new asset ownership, tax and financial reporting models.

B.10 Federal Transit Administration New Starts Grant Process

Commuter rail agencies may plan to use FTA New Starts grants to provide some of the funds needed for a new or expanded rail service. The process used by the FTA to review and accept applications for grants is quite complex and affects how a commuter rail agency must conduct access negotiations with a freight railroad. Some commuter agencies have commented that the FTA's program requires that an agreement with the rail carrier be in place before the funding application can move forward. Because many railroads are unwilling to seriously discuss a proposed operation until funding is demonstrated, a "chicken and egg" situation is created.

The underlying statute [49 U.S.C.§5309] requires that the Secretary of Transportation make certain findings before approving a grant application. These mandated findings include:

(1) The project is part of an approved transportation plan;
(2) The applicant has or will have:
    (a) The legal, financial, and technical capacity to carry out the project;
    (b) Satisfactory continuing control over the use of the equipment or facilities; and
    (c) The capability and willingness to maintain the equipment or facilities.

As required by the Transportation Equity Act for the 21st Century or "TEA-21," on December 7, 2000, the FTA published its Final Rule governing candidate project evaluation. The discussion of the Rule points out that the FTA intends to use the technical capacity factor as an indicator of the ability of the sponsor to successfully implement a proposed new start as well as an indicator of project "readiness." The discussion goes on to say that by "readiness" is meant that there are no outstanding issues to be resolved before a funding commitment can be considered.

The current statute, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) requires the FTA to publish "Policy Guidance" at periodic intervals. In addition, the FTA has published "Major Capital Transit Investment Fact Sheets" for guidance on various subjects. The Fact Sheet on Final Design states that, " . . . During final design, most third party agreements required for completion and/or operation of the project are negotiated and executed, **including agreements with railroads**. . . ." Once these steps have been completed, the FTA will begin negotiations toward a Full Funding Grant Agreement (FFGA).

Based on the statute and the regulations, a grant cannot be approved until the applicant has demonstrated ability to build and operate the project. Clearly, if railroad facilities are to be used or a rail carrier is to operate the project, appropriate agreement(s) would have to be in place. Conversely, based on the FTA's guidance materials, such agreements would not have to be executed until the final design phase. The pragmatic approach to this problem for a passenger rail agency is to bring both the FTA processes and railroad negotiations along in parallel, ensuring that each is kept informed of the other's situations, and in particular making sure that the railroad understands the legal constraints that apply to the FTA FFGA process.

B.11 1990 Americans with Disabilities Act and Level-Boarding Requirements

All passenger rail operations in the United States are subject to applicable requirements of the 1990 Americans with Disabilities Act (ADA). A discussion of the details of that law and numerous regulations promulgated thereunder is beyond the scope of this project. However, there is one issue

under these regulations that could have a significant bearing on access negotiations for passenger rail service on freight railroad tracks. This concerns level-boarding requirements for disabled access to passenger railcars. Current practice, where passenger cars with a conventional floor height are used and there is no full-length high platform level with car floors, is to provide short "mini-high" platforms for disabled access. Bridge plates are used to cover the cap between the platform edge and the car for wheelchairs. This arrangement means there is disabled access to at least one car of the train, but not necessarily to all cars. If the track is used by freight trains, disparities between the width of passenger cars at floor height and the clearance required for freight equipment means there is a considerable gap between platform edge and the car floor.

Commuter rail operators have recently expressed concern over the Notice of Proposed Rule Making (NPRM) published by U.S.DOT on February 27, 2006. Among other things, this proposal would impose new requirements for level boarding and station construction, as well as for new commuter rail cars.

Regarding "level boarding," the primary objections relate to the proposal to more precisely regulate the vertical and horizontal gaps at boarding locations, to revise the requirement for bridge plates, and to require accessibility along the entire length of a train. The proposal would entail heavier and longer plates, which would have to be stored in locked boxes on the platforms and which would require two crew members to deploy.

The proposal also would mandate that "level boarding" be provided for each accessible car on the train. Currently, only one such car is required to be equipped for level boarding or a bridge plate. If adopted, this would result in: (1) a series of bridge plates along high-level platforms, which causes delays as crew members deploy them manually at various cars, and (2) a series of mini-high platforms with bridge plates at low-level platform stations, again with resulting cost and delay time.

The proposal recognizes that freight operations frequently impair the ability to construct full-length high-level platforms and suggests a series of mini-high platforms or the use of gauntlet tracks. Gauntlet tracks require a turnout at each end of the station with significant capital and maintenance cost impacts, and additional signal and train control apparatus. Commuter rail operators oppose use of gauntlets because of the great expense, possible need for land acquisition, and environmental concerns. Anticipating disagreements between commuter and freight operators, the rulemaking discussion points out that the ADA requires facility owners to provide reasonable cooperation in making facilities accessible. Construction of gauntlet tracks could be a way of providing such cooperation, albeit at great expense to the commuter agency. New York's Metropolitan Transit Authority estimates the cost of constructing gauntlets at a single commuter rail station, together with related signal and other changes, to approach $16 million.

The passenger railroads submitted numerous other legal and technical comments in response to the NPRM. Those beyond the level boarding issue are beyond the scope of this report. The fact that the matter remains open more than 2 years after issuance of the NPRM suggests the complexity of the problems. Any passenger rail authority entering access negotiations with a freight railroad must familiarize itself with the current status of ADA access requirements and address them in the negotiations.

APPENDIX C

Railroad Safety Regulations

Contents

C.1 Introduction to Federal Railroad Administration Safety Regulations

Federal Railroad Administration (FRA) regulations and standards pertaining to the safety of railroad plant, equipment, and operations are contained in 49 Code of Federal Register (CFR) Parts 200-299 (49 CFR 200-299, Title 49 - Transportation, Subtitle B - Other Regulations Relating to Transportation, Chapter II - Federal Railroad Administration, United States Department of Transportation [U.S.DOT]). The same body of regulations also contains regulations pertaining to non-safety matters (for example concerning Amtrak operations) that are not discussed here.

With one exception, the FRA Office of Safety is responsible for developing and enforcing railroad safety regulations. The FRA follows the normal federal process for developing new and amended safety rules, including publishing a Notice of Proposed Rulemaking (NPRM), allowing for public input and discussion, and then promulgating a Final Rule. A number of years ago the FRA also established a Railroad Safety Advisory Council (RSAC) with representatives of industry and labor which, on invitation by the FRA, will assist with regulation development. The FRA and RSAC have been very active in recent years in developing new regulations to address such issues as passenger car safety, communications-based train control systems, and new technologies such as hand-held controls for switching locomotives and electronically controlled brakes for freight trains.

A notable exception to this rulemaking process is the Hours of Service (HOS) Act (49 CFR 228, Hours of Service Act [Revised October 1, 1996]). This Act is a separate statute and the requirements therein can only be changed by Act of Congress. Prior to October 2008, these requirements, which had been amended multiple times since the original Act in 1907, were cumbersome to change and did not reflect current understanding of the effects of train crew and dispatcher fatigue on safety. The Rail Safety Improvement Act (RSIA) that passed Congress in October 2008 (H.R.2095. Rail Safety Improvement Act of 2008) updated the Hours of Service Act, and also required the FRA to develop regulations to enforce the new statute and to further HOS regulations for passenger and freight operations. Details are provided in Section C.5.

C.2 Applicability

The FRA railroad safety regulations are applicable to all rail lines connected to the "general railroad system of the United States." The FRA does not regulate fully segregated urban rail transit systems (subways, light rail, and streetcar systems), except at the few points where such systems interact with the general rail system. The applicability of FRA safety regulations where conventional rail services and urban transit services share tracks and corridors is discussed later in this section. Other points about applicability are:

- The FRA specifically has authority over any new-technology guided ground transportation system, including magnetic levitation systems and systems that use non-United States (U.S.) high speed train technology, except where these systems provide urban transit services as defined above. The FRA requires an operator proposing to use these technologies to submit a "safety case," containing full details of safety related aspects of infrastructure, vehicles, and operations showing how adequate safety will be achieved and maintained. The FRA reviews the submissions, works with the applicant to ensure all safety issues are properly addressed, and develops a "Rule of Particular Applicability" documenting the terms and conditions under which the proposed system can operate. These rules essentially make the operator's safety case (with any amendments and conditions imposed by the FRA) a regulation that must be followed. The best practical example of this process is the Rule issued for a proposed high-speed line between Miami, Orlando, and Tampa in Florida. Although the project did not go forward in the end, a Rule of Particular Applicability was completed and issued for this system, which used French TGV

technology. In the future, this process is likely to be applied to the proposed California high-speed rail system and a private initiative for high-speed rail service between the Los Angeles, California area and Las Vegas, Nevada.

- The situation regarding a fully or largely segregated commuter rail system is somewhat ambiguous. As for intercity guided ground transportation systems, commuter rail systems appear to be subject to FRA safety regulations, whether or not they are connected to the general rail system. However, the exact boundaries between a commuter and an urban transit system are not well defined, and a longer-distance and higher-speed light rail line that provides service outside a single urban/suburban area may fall into this gray area. This is especially true if there are elements of connection with the general rail system, such as a shared corridor or limited local freight service. A recently completed light rail line in Austin, Texas and Triangle Transit proposals in the Raleigh–Durham area of North Carolina are examples of proposed operations where this ambiguity might be a factor in determining the extent of FRA jurisdiction.

C.3 Waivers

Any operator who wishes to have relief from any FRA safety regulation must seek a waiver. The operator must submit a waiver application to the FRA detailing what relief is sought, analysis to demonstrate that the safety of the proposed operation will be equivalent to a fully compliant operation, and a justification for the waiver showing that it would be in the public interest. Public interest means that the waiver would enable rail service operators to offer passengers and/or freight shippers a higher quality or lower-cost service than would be possible with a fully compliant operation. The FRA may grant a waiver if it is satisfied that the waiver is in the public interest and safety is not impaired.

The waiver process as currently applied can be a barrier to the introduction of new passenger rail technology, especially related to non-FRA-compliant rolling stock. The process is slow and uncertain and requires a lot of detail about the proposed operations and equipment, which is only available when a project is well advanced. A service developer may be put in the position of having to commit to system features before a waiver is finalized and risk delaying the project if the FRA requires significant changes. Some developers have elected to proceed with a fully compliant approach to avoid delay risks, even though a non-compliant approach would improve the service. However, efforts were under way in 2009 by Caltrain and the FRA to investigate the feasibility of using non-compliant European-style electric multiple unit (MU) trains for service between San Francisco and San Jose, California. This and similar waiver applications have prompted the FRA to initiate an effort to formalize a process and acceptability criteria for non-compliant rolling stock. If successful, this would make the waiver process more predictable and easier to incorporate into project schedules. Further discussion of the use of non-FRA-compliant rolling stock is provided in Section C.9.

C.4 Track Safety Standards (49 CFR Part 213)

These standards contain numerous requirements defining minimum acceptable track conditions and inspection regimes for each track class, as defined by the FRA (49 CFR 213, Track Safety Standards). Maximum speed by FRA track class for the classes most likely to be used for shared passenger and freight service are as shown in Table C-1.

Freight railroads typically maintain FRA Class 3 on secondary and lower traffic main lines and FRA Class 4 on primary main lines. There is also a significant amount of FRA Class 5 track on freight railroads, often on routes used by higher-speed intermodal services. FRA

Table C-1. Maximum allowable speeds for passenger and freight trains by track class.

FRA Track Class	Maximum Allowable Speed (mph)	
	Passenger	Freight
3	60	40
4	80	60
5	90	80
6	110	110

Class 6 is almost never found on a freight railroad, but is the standard used on predominantly higher-speed passenger lines such as the Empire Corridor between New York City and Albany, New York and parts of the Northeast Corridor (NEC). FRA Class 3 track is the minimum acceptable for commuter operations, and a majority of intercity services are operated on FRA Class 4 or 5 track. The FRA also defines requirements for Classes 1 and 2 for low-speed branch line and yard track. Existing FRA Class 1 or 2 track proposed for passenger service would have to be extensively rebuilt. Finally, the FRA has defined Classes 7, 8, and 9 for true high-speed passenger operations (above 110 miles per hour [mph]), applied to date only on portions of the NEC.

The FRA standards do not include any requirements for track design, such as weight of rail, types of ties and rail-tie fasteners, etc. Provided the condition standards are met and maintained, any form of construction may be used.

C.5 Train Crew Hours of Service (49 CFR Part 228 and the Railroad Safety Improvement Act of 2008)

Prior to October 2008, train crew work schedules were governed by the historic Hours of Service (HOS) Act, first passed in 1907 and amended many times since. Prior to RSIA, the principal provisions of the Act were that the maximum time on duty of a train crew must not exceed 12 hours except in an emergency, and must be followed by a minimum of 10 hours off duty before the start of the next on-duty period. FRA regulations define time spent waiting for transportation and traveling to a sign-off point after an on-duty period as being neither on- nor off-duty time. This period is sometimes termed "limbo time." FRA regulations also prescribe record-keeping and reporting requirements to monitor compliance with the law.

These requirements will be replaced by those detailed in Section 108 of RSIA for **freight train operations only.** The principal requirements for railroad train crews are:

- A limit of 276 hours per calendar month for combined on-duty and limbo time. [This limit is entirely new. Previously limbo time did not count as either on-duty or rest time].
- Maximum 12 consecutive on-duty hours [same as before RSIA].
- Minimum 10 uninterrupted off-duty hours after a 12-hour on-duty period. [Similar to pre-RSIA, but off-duty time now **cannot** be interrupted by calls from the railroad giving notice of the start of an on-duty shift. Because freight train crews are typically called 2 hours before reporting for duty at their sign-on point, this provision effectively lengthens off-duty time by 2 hours].
- Minimum 48 uninterrupted off-duty hours after 6 consecutive days with on-duty shifts [entirely new].

These requirements went into effect on July 16, 2009, 9 months after enactment, by which time the FRA and railroads must have established record-keeping and reporting requirements for enforcement of the law.

Passenger rail operators continue to be subject to the old HOS laws for a period up to 3 years from October 16, 2008. During this time, the FRA must develop HOS regulations for passenger service that minimize crew fatigue and improve safety, while as far as possible, serving the needs of commuter and intercity passenger operations. If passenger HOS regulations are not finalized before October 16, 2011, then the freight HOS law will apply.

C.6 Drug Testing and Engineer Certification (49 CFR Parts 219 and 240)

All railroad employees are subject to periodic drug and alcohol testing, including after an accident. The regulations specify the testing regime in detail and actions to be taken in the event of a positive test.

Before the enactment of RSIA, only locomotive engineers were required to have FRA certification, earned by successfully completing an approved training course and periodic testing and refresher courses as necessary. RSIA extended this requirement to conductors, and the FRA is required to investigate the need for formal certification for other safety-related occupations, including dispatchers and signal maintainers.

C.7 Signal and Train Control System Regulations before the Railroad Safety Improvement Act (49 CFR Parts 235 and 236)

This section describes FRA signal and train control systems regulations, before implementation of positive train control (PTC) requirements of RSIA, and will continue to apply to conventional signal systems retained after PTC installation. Early information on railroad response to the PTC mandate of RSIA is that PTC will be an overlay, and conventional signal systems will remain in service. These regulations apply on any rail line in the United States unless conventional signal systems are completely replaced by PTC or equivalent new-technology system. The PTC mandate and associated implications for shared passenger and freight operations are discussed in Section C.7.

Part 235 requires railroads to apply to the FRA to discontinue or materially change a signal and train control installation (49 CFR 235, Instructions Governing Applications for Approval of a Discontinuance or Material Modification of a Signal System or Relief From the Requirements of Part 236). The rationale for this regulation is to ensure that railroads do not change signal systems in a way or in circumstances that could increase accident risks.

Part 236 contains numerous requirements for the design, installation, maintenance, and inspection of traditional-technology signal and train control systems (49 CFR 236, Rules, Standards, and Instructions Governing the Installation, Inspection, Maintenance, and Repair of Signal and Train Control Systems, Devices, and Appliances). These details are familiar to signal engineers and apply equally to passenger and freight operations. Conventional signal regulations are rarely a significant issue in shared corridors, except the provisions of Part 236.0 defining the applicability of the requirements. Part 236.0 provisions are:

- A block system of train control that ensures that a passenger train cannot enter an occupied block and that no other train can enter a block occupied by a passenger train is required where passenger train speeds exceed 59 mph.
- Automatic cab signals (ACS), automatic train stop (ATS), or automatic train control is required where any train exceeds 79 mph. This provision is very important for any proposal for passenger train speeds exceeding 79 mph, as most freight lines are not equipped with a qualifying train control system.

Note that requirements for over-79 mph operation may change when PTC is implemented. PTC would likely meet current requirements for operation over 79 mph, but this can only be confirmed after the FRA has developed detailed regulations for PTC implementation.

Before enactment of RSIA, practice for routes with passenger traffic, reflecting FRA requirements defined in the detailed regulations, FRA interpretations of the regulations, and industry practice generally are as follows:

- All passenger lines should have at least an automatic block system with wayside block signals linked to track circuits. Except for short, low-speed route segments near passenger terminals, there are few exceptions to this practice.
- For speeds between 80 and 110 mph, the minimum requirement is cab signals with automatic train stop. There are some routes (mostly former Santa Fe Railway routes) where passenger trains are permitted to travel at 90 mph with a simple intermittent automatic train stop system. However, the FRA has stated that it considers this system to be obsolete and would not approve a new installation.
- For speeds between 110 and 125 mph, an automatic train control (ATC) system is required to provide automatic speed control in response to signal indications. This system is applied on the NEC. The FRA further requires that all trains operating on ATC-equipped lines, including freight trains, must be equipped with a compatible system. Freight trains that operate on the NEC are so equipped, but the FRA has granted selective waivers to this requirement on other routes.
- For speeds over 125 mph, the FRA requires additional capabilities to further reduce accident risks. On the NEC, the only installation to date, this took the form of the Advanced Civil Speed Enforcement System (ACSES) overlaid on ATC. ACSES uses line side transponders for track-to-train communications, to enforce civil speed limits, and to ensure an absolute stop at interlocking signals.

Note that all these requirements and practices will change with implementation of the PTC requirements in RSIA, as described in Section C.8.

C.8 The Positive Train Control Mandate of the Railroad Safety Improvement Act

RSIA, signed into law on October 16, 2008, requires that a qualified positive train control system be installed on main lines carrying regularly scheduled passenger service and/or specified hazardous materials shipment. The requirements are found in Section 104 of RSIA, and state:

> Not later than 18 months after passage of this Act (i.e., by April 16, 2010), all Class 1 freight railroads and each entity carrying regularly scheduled passenger service must prepare and submit to the U.S.DOT a plan for implementing PTC on:
>
> - Main lines over which regularly scheduled commuter or intercity passenger services are operated.
> - Main lines over which poisonous- or toxic-by-inhalation (PIH/TIH) hazardous materials are transported.
> - Such other lines that the Secretary of the U.S.DOT may prescribe by regulation or order.
>
> The plans must show how the railroad will complete PTC implementation by December 31, 2015, provide for interoperability to facilitate the movement of trains belonging to other carriers over its tracks, and to the extent possible give priority to areas of greater risk.

Main lines are defined as those carrying over 5 million gross tons/year of railroad traffic, equivalent to about three freight trains per day. PTC is defined as a system that will prevent train-to-train collisions, over-speed derailments, incursions into established work zones, and movement of a train through a switch set in the wrong position.

RSIA requires the U.S.DOT Secretary (in practice, the FRA Office of Safety) to take a number of actions to implement PTC:

- Provide technical assistance to the railroads for developing their PTC implementation plans. This is likely to include guidance as to the content and level of detail in the plans.
- Establish detailed regulations prescribing the functional requirements of a qualified PTC system and how individual systems and plans will be reviewed and qualified as acceptable.
- Establish regulations for PTC implementation on lines used for commuter or intercity passenger service, but which carry little or no freight.
- Complete reviews of railroad PTC implementation plans within 90 days of submittal and either approve the plan or provide a detailed notification of deficiencies, which the railroad must correct within 30 days.
- For each approved plan, conduct an annual review of progress toward implementation.
- Individual PTC systems and installations must be approved using the procedures defined in Part 236, Subpart H as described in Section C.8.

The FRA established a Working Group under the RSAC early in 2009, to assist the FRA to develop regulations and guidelines for the implementation of PTC.

The PTC mandate clearly adds uncertainty to the implementation of a new or expanded passenger service on Class 1 freight railroad tracks. Some of the questions concerning the application of PTC to shared passenger/freight rail corridors include:

- To what extent will the FRA require PTC installation on non-Class 1 freight railroad tracks used by passenger trains? Initial information suggests that the FRA will require PTC on all lines that carry regularly scheduled passenger service.
- To what extent will the FRA require PTC to be implemented on exclusive or near-exclusive passenger lines, and will upgrades or replacements of existing traditional cab signal and ATC systems be required? Initial information is that ATC plus ACSES or an equivalent will be accepted as equivalent to PTC.
- Will a qualified PTC system be accepted as meeting the requirements of Part 236.0 for operations over 79 mph for speeds over 110 mph, or will additional functional capabilities be required? (Note that the NEC ATC plus ACSES appears to meet all PTC functional requirements.)
- What principles will govern how PTC installation and maintenance costs are shared between passenger and freight users of a rail corridor? This could be a critical issue for passenger rail interests, as PTC costs are expected to be very high and could substantially increase the cost of implementing and operating passenger rail service.
- Will the PTC interoperability requirements worked out among Class 1 freight railroads pose any problems for passenger service operators?
- To what extent will the FRA allow operations on the same line with a mix of PTC-equipped and unequipped trains?

These questions will be resolved as the industry and the FRA move forward with PTC planning, approval, and implementation. Publication of a NPRM on requirements for PTC plans and installations took place in June 2009 and is the first formal step toward answering these questions.

C.9 New Technology Train Control Systems

These systems apply electronic processing and digital radio communications technologies to perform train control functions. Most PTC systems being proposed to meet the PTC mandate in RSIA apply these technologies. Because most of the regulations in Part 236 are written for traditional signaling hardware, they cannot be applied effectively to these new-technology systems. Accordingly, the FRA has developed a new regulation found in Part 236, Subpart H, Standards for Processor-Based Signal and Train Control Systems. The standards take a "safety case" approach, requiring the railroad and system vendor to demonstrate that the system and the proposed specific

application is safe, using hazard analyses, risk analyses, defined installation and maintenance practices, and staff training as appropriate.

Obtaining approval for a new system under Subpart H requirements can be a considerable challenge. Detailed safety analyses are required for both the system itself (control center, on-board and trackside systems, and the communications systems that link system components) and for applications to specific routes and rail operations. Given the large number of PTC approval applications expected for PTC installations in response to RSIA, the FRA is understood to be looking at ways to streamline the approval process without compromising safety, especially where a single technology is being applied to multiple railroad route segments.

C.10 Passenger Car Safety Standards and the Operation of Non-FRA-Compliant Vehicles on Shared Corridors (49 CFR Part 238)

Passenger Car Safety Standards are contained in 49 CFR Part 238 (49 CFR 238, Passenger Equipment Safety Standards). The standards were issued on May 12, 1999. Part 238 standards together with selected Part 229 locomotive standards provide detailed requirements for railroad passenger cars, including structures, safety glazing, interior fittings, fire safety, emergency egress, inspection procedures, and brakes (49 CFR 229, Railroad Locomotive Safety Standards). Two separate sets of standards are provided: Tier I, for cars operating at up to 125 mph, and Tier II for speeds over 125 mph. Among other requirements, Tier II standards specify the use of crushable energy absorbing structures for occupant protection in collisions. Car builders are very familiar with the standards, and almost all vehicles purchased after the regulation became effective are fully compliant.

Rail passenger car safety technology continues to advance, and further development of passenger car safety standards can be expected, in response to research results and the findings of accident investigations. This development will likely include the conditions under which operation of non-compliant passenger cars will be permitted, as discussed below, and to reflect the changes in exposure to collision risk resulting from universal application of PTC.

C.10.1 Operation of Non-FRA-Compliant Passenger Vehicles

The issues of whether and how to permit non-FRA-compliant passenger rail vehicles to operate on the general railroad network have arisen regularly over the past two decades. This interest is driven by a desire to offer innovative rail services or to use attractive existing train designs from outside North America without incurring the cost and time delay of redesigning trains to meet U.S. standards. Examples of applications of non-compliant vehicles are:

- Implementing high-speed intercity passenger service using foreign, primarily European-design trains.
- Implementing light rail passenger services over existing lightly used local freight lines.
- Using European-design electric multiple unit commuter trains, most notably for the Caltrain service between San Francisco and San Jose, California.

The following paragraphs provide a summary of what is meant by "non-FRA-compliant" passenger rail vehicles, referring to technical reports, applicable FRA safety regulations, and the current status of efforts to introduce and use such vehicles on the general railroad network.

C.10.2 Definition of Non-FRA-Compliant Passenger Vehicles

A non-FRA-compliant passenger vehicle is one that does not fully meet all current FRA safety regulations applicable to passenger rail vehicles operating on the general rail network. The primary

area of non-compliance has always been the regulations and standards for the strength of passenger car structures, which can have a major bearing on the safety of rail passenger cars in collisions.

There have been substantial changes to the regulatory landscape over the past 15 years. Prior to the early 1980s, the Association of American Railroads (AAR) Manual of Recommended Standards and Practices contained a volume devoted to passenger cars. The Manual required the end-load compression strength (commonly called buff strength) of a passenger car for unrestricted use in interchange service to be 800,000 lb, with other structural requirements to match. A lower buff strength of 400,000 lb was permitted for trains having an empty weight below 600,000 lb, on the logical grounds that collision impact loads are lower for lighter trains. This exception was rarely used—the only instance since 1970 has been the French-built turbo trains purchased in the early days of Amtrak, which had the European buff strength of 440,000 lb (200 metric tons). Most buyers did not want to operate a vehicle that would be restricted to lightweight trains. FRA regulations of the same era, in 49 CFR Part 229 (strictly applicable only to MU cars not expressly covered in the AAR Manual), were identical to the AAR standards. Otherwise, the FRA took the view that passenger car structural safety was effectively managed by the AAR.

In the early 1980s, the AAR stopped maintaining passenger car standards, and safety standards were left to the specification writers for individual passenger rail service operators, who continued to follow earlier practice. This regulatory vacuum became a concern as interest grew in the operation of high-speed and new-design intercity passenger trains. The FRA responded by initiating a substantial program of research into passenger car collision safety and the development of new passenger car standards applicable to both conventional and high-speed trains (Ullman and Bing 1995). The development of specifications for Amtrak's Acela trains was deeply enmeshed in the process. Safety-related specification requirements for Acela were reviewed with the FRA, and the agreements reached influenced development of the resulting FRA standards. The new regulations in 49 CFR Part 238 became effective in May 1999 (49 CFR Parts 200-299, Specifically Part 238, current FRA Safety Standards contained in Passenger Car Safety Standards (Effective May 1999), Part 236, Signal and Train Control Standards, and Part 213, Track Safety Standards). The regulations eliminated the exception to the 800,000 lb buff strength requirement for trains under 600,000 lb and added new requirements for collision safety for trains operating at over 125 mph (i.e., the Acela). There have been a number of additions to passenger car safety requirements since 1999, notably in fire safety and emergency egress, and regulatory development continues.

C.10.3 Non-compliant Intercity Trains

There were two notable exceptions to Part 238 proposed or implemented during the 1990s for intercity passenger service. These were:

- The Florida Overland eXpress (FOX) proposal for high-speed service in Florida (49 CFR 243, FOX High Speed Rail Safety Standards, Proposed Rule, Federal Register, December 12, 1997). This service reached an advanced planning stage before being cancelled, including a full review of the plans by the FRA, resulting in a Rule of Particular Applicability specifically for this project. This approach was (and presumably still is) the way that the FRA Office of Safety deals with new-technology–guided passenger transportation systems that fall within its jurisdiction, and which have limited interaction with the general rail network. This Rule covered all the same safety issues as the conventional rules in 49 CFR Parts 200-299, but adapted to this specific system. FOX proposed using French Train a Grande Vitesse (TGV) technology, and the Rule is basically an adaptation of French practice, including European passenger car body strength requirements. The proposed operation would have used a completely new alignment with virtually no physical connections to the existing rail network.

- Talgo trains operate in Amtrak's Pacific Northwest corridor between Portland, Oregon and Seattle, Washington (U.S.DOT 1999). The Talgo is a unique articulated train design, originating is Spain, which used passive pendular tilting to increase speed in curves and thus reduce journey time. Five train sets were put into service between 1995 and 1999, and except for some structural problems (that have been corrected) have been a commercial and operational success. The Talgos are operated push–pull fashion with an Amtrak locomotive at one end and a cab-baggage car (an F40 locomotive with the power equipment removed) at the other. These Talgo trainsets are nearly identical with the European version and are built to European structural requirements, including 440,000 lb (200 metric tons) buff strength. The operation takes advantage of a "grandfathering" provision in the 49 CFR Part 238 (Passenger Car Safety Standards) permitting the operation of non-compliant equipment put into service before the effective date of the rule, subject to review and approval by the FRA.

  The FRA's initial approval was challenged (by a competing supplier) on safety grounds, after which the FRA required Amtrak and Talgo to undertake detailed risk and collision analyses to demonstrate that the operation was safe. The analyses are documented in the U.S.DOT docket for the grandfathering petition and remain the most complete example of what it takes to gain approval of a non-compliant or otherwise unconventional train on a busy passenger/freight corridor. It should be noted that part of the "safety case" was the commitment to keep the first car of the train (baggage, auxiliary power generator or otherwise) as an "unoccupied space." With compliance with 49 CFR Part 238 in full effect, including the requirement for 800,000 lb buff strength with no exceptions, any future effort to introduce non-compliant vehicles will be more challenging.

C.10.4 Use of Light Rail Vehicles on the General Rail System

The genesis of much of the research on this topic came from the series of reports by David Phraner (Phraner 2001; Phraner 2000a; Phraner 2000b; Phraner et al. 1999) and colleagues focusing on overseas developments in the application of light rail transit (LRT) and diesel multiple units (DMUs) in rail transit and commuter service, and the shared use of railroad infrastructure by both light rail and conventional rail services. The particular attraction of this form of sharing is that it allows a one-seat ride from points on an inner-city light rail network to suburban locations accessible via existing railroad tracks.

This form of shared use caught the attention of the U.S. transit community and gave impetus to development of shared operations. One of the most visible U.S. projects to evolve from limited acceptance of non-compliant shared use was NJT's RiverLINE between Camden and Trenton where a light rail service sharing track with local freight operations was being implemented. A request was submitted to the FRA for approval of the proposed operation, which directly conflicted with the new Part 238, which was then about to be published and which would prohibit such operation. After some deliberation, the FRA and the FTA published a proposed joint rule that shared operation would be permitted but with strict time-of-day separation (FRA and FTA 2000). NJT had to revise planned RiverLINE operations to comply with this requirement, with daytime passenger and overnight freight operations. Both parties had to accept less-than-ideal restrictions. Two other light rail transit lines with limited sharing (Baltimore, Maryland and St. Louis, Missouri) also complied, but with little inconvenience given very sparse freight operations. The San Diego Trolley, which had operated a shared use LRT line without attracting attention for years, also had to modify its operations.

Because of these events, both the FRA and the National Academies' Transit Cooperative Research Program (TCRP) have initiated projects to further explore the safety and feasibility of shared light rail operations. The conclusions reached by these studies are:

- It is feasible (i.e., safe and operationally practical) for light rail service to share tracks concurrently with limited local freight operations during off-peak hours (Bing et al. 2007; Gross and Mortensen 2007). The key safety measure is to implement some form of automatic collision protection (train stops or ATC) to minimize collision risk.
- There are a number of potential applications where concurrent shared light rail and local freight-rail operations would be the best alternative to meeting both freight and passenger mobility needs (cheaper, better able to meet service needs) (Booz Allen Hamilton et al. 2009).
- The best way to implement the shared operation is for the transit agency to acquire the right-of-way and to give the freight operator permanent access to agreed train slots in off-peak hours (Booz Allen Hamilton et al. 2009).

The investigators in these studies express the view that this subject has been analyzed enough in the abstract, and the next step is a pilot project to implement a concurrent shared-use operation, including working with the FRA Office of Safety to gain approvals. The most likely locations for a demonstration would be further expansion of sharing on the San Diego Trolley or on the Southern New Jersey RiverLINE. Both operators have substantial service experience with limited sharing and both would benefit from expanded concurrent operations.

In parallel with this research, the FRA has recently permitted limited concurrent operations on both San Diego Trolley and the RiverLINE with appropriate safety controls and tightly defined operating procedures.

APPENDIX D

Case Studies of Passenger Rail Service Developments and Processes

Contents

D.1 Introduction

This appendix contains six case studies that illustrate how effective processes have been applied in successful passenger rail developments. The case studies are of two types. One type describes the development of passenger rail services on a single corridor or region, combining an overview of the history of the service(s) with a description or descriptions of processes that were influential in the success of the service. The examples of successful practice selected for a case study are:

- Development of passenger rail services in California, highlighting two functional areas: use of connecting bus services to extend the reach of passenger rail services; and methods used to ensure adequate capacity and good service on a busy freight corridor.
- The role of establishing a vision and long-term planning on the development of intercity and commuter passenger rail services in Washington State.
- A process developed by the BNSF Railway for quality management of commuter rail services, initially applied in Chicago.
- The highly collaborative approach used by the NNEPRA in developing the Downeaster service between Boston and Portland, Maine with the participation of state and local governments, Amtrak and host railroads.

The second type comprises two syntheses of successful processes in specific functional areas: the negotiation process and setting fees and incentives payable to the host railroad.

The source for the information presented in the case studies were primarily interviews with agencies and railroads responsible for developing, managing and operating the services, supplemented by information from reports, plans, federal, state and local government agencies, news articles and internet sources. It should be noted that the bulk of this material was gathered in 2008, prior to the passage of PRIIA and ARRA.

D.2 Passenger Rail Developments and Processes in California

There have been few large-scale passenger rail developments in the period since the late 1970s, where entirely new commuter and corridor-type intercity passenger services have been developed throughout a region. All are on the west coast of the United States (U.S.): two in California and one in Washington State. This section discusses developments in California, focusing on the southern area of the state centered on Los Angeles and on the northern area centered around San Francisco and Sacramento.

D.2.1 Southern California—Metrolink, Coaster, and the Pacific Surfliners

After the abandonment of the Pacific Electric interurban rail network by 1961, passenger rail service in Southern California was limited to a few long-distance services operated by the freight railroads. After a gap of more than 20 years, local rail service re-started in southern California to help relieve ever-growing highway congestion. The first initiative was the construction of a light rail line between Los Angeles and Long Beach along a former Pacific Electric right-of-way, starting in 1985. Other light and heavy rail lines followed. At the same time, interest grew in expanding rail service to include commuter rail, culminating in the approval of dedicated sales taxes in five counties around Los Angeles (Los Angeles, Orange, San Bernardino, Ventura, and Riverside) and approval of State Bond Propositions 108, 111 and 116 for capital expenses, all in 1989 and 1990. A portion of the bond funds were used to purchase more than 200 miles of railroad right-of-way, mostly from Southern Pacific and the Santa Fe, with a smaller amount from the Union Pacific (UP), for a total cost of more than $500 million.

The Southern California Regional Rail Authority (SCRRA) was established in 1991 as a Joint Powers Authority under California law to implement and operate commuter rail services in the five-county region. Services are marketed under the Metrolink name. Train operations started on three routes in 1992 and have grown steadily since through additional routes, stations, and train frequencies. In 2008, the system comprised seven routes, 388 route-miles and 54 stations, carrying more than 40,000 weekday passenger trips. SCRRA services run over a mix of freight railroad–owned and county-owned tracks. The original owners of publicly owned lines retain the right to operate freight service. SCRRA negotiated access terms and fees for services operating over freight railroad–owned track.

The other commuter rail service in southern California is a single line from San Diego to Oceanside where there is an end-to-end connection with a Metrolink service and to a new light rail line to Escondido that opened in March 2008. This service is contractor-operated on behalf of North County Transit District (NCTD). NCTD purchased this line, as well as the Escondido branch, from the Santa Fe railroad in 1994.

The Amtrak intercity service in the area, known as the Pacific Surfliner, connects Los Angeles with San Diego and San Luis Obispo. The corridor, also known as the LOSSAN corridor, is owned by the county transportation authorities along the route between San Diego through Los Angeles to Moor Park, acquired from the Santa Fe and UP in 1991–1992 for SCRRA and NCTD commuter rail services, as described above. North of Moor Park the route belongs to the Southern Pacific, which was acquired by the UP in 1995. The Pacific Surfliner corridor, especially the southern portion between Los Angeles and San Diego, has long been identified as one of the most promising high-speed corridors in the United States, and had been a priority for development. It is also Amtrak's second-busiest corridor after the Northeast Corridor. At the startup of Amtrak, there were only two round trips per day between Los Angeles and San Diego, operated as part of the core Amtrak network. One round trip was added in 1976 as one of the first state-supported services under what was then the 403b program. Further trips have been added since, all with state support, so that there are now 12 round trips between Los Angeles and San Diego. On the northern part of the corridor, service has grown to five round trips between Los Angeles and Santa Barbara with two trips extending to San Luis Obispo, plus the daily long-haul Coast Starlight between Los Angeles and Seattle.

In cooperation with the commuter agencies, California DOT has continued to make investments along the line, including on UP track. These improvements include installing CTC and more and longer sidings resulting in improved capacity and operating speed. Further developments are in the planning stage. There is no single coordinating agency for these developments—Caltrans and Amtrak plan the developments with inputs from committees of governments and rail service operators in the service area. In 1995 and 2002 California also purchased a fleet of passenger cars and locomotives for intercity passenger service, totaling 126 California Cars, and 15 F59PHI locomotives. These include cab cars for push–pull operation, that are used on the Surfliners and Capitol Corridor trains, together with converted F40 locomotives used as cab/baggage cars on the San Joaquin Service in northern California.

The last factor in the region is investment directed at the freight network. The Alameda Corridor (another joint powers authority) has constructed a dedicated and fully segregated freight line from the ports of Los Angeles and Long Beach to the center of Los Angeles. This project provided a limited but valuable benefit for passenger service by building a flyover and improving track layout at Redondo Junction, just south of Los Angeles Union Station. A second investment program in the Alameda Corridor East will minimize grade crossings along the UP line east from Redondo Junction toward San Bernardino.

The effect of these investments in both commuter services and the Pacific Surfliner Amtrak intercity service has been massive increases in ridership. On Metrolink, the steady expansion of routes

and daily trips from the beginning in 1992 has resulted in steady growth in annual passenger trips from zero in 1992 to 4.6 million in 1995, 8.1 million in 2000, 10.3 million in 2005 and 12.2 million in 2008. The San Diego to Oceanside commuter service experienced similar steady growth to 1.7 million trips by 2008 from its startup in 1995. The Surfliner Amtrak has also experienced rapid growth after 2000 after a period of level ridership in the 1990s. The initial service expansion on this route occurred earlier, between 1976 when the first state supported trips were introduced to supplement services provided as part of the basic Amtrak network. Growth has been massive after 2000, growing from 1.66 million trips to 3.10 million in 2008.

Aside from varying economic conditions, much of this growth has been due to a steady program of well-planned investments to remove operating constraints, reduce journey times and add capacity—daily round trips and additional cars on trains—all built around a regularly updated planning process. This illustrates the benefits from steady long-term support from all levels of government. High quality and well patronized rail services cannot be built on a one-time quick fix investment. It takes time to plan and execute investments and to build a loyal customer base. Another factor for the Pacific Surfliner services is a network of connecting bus services to link train stations to communities that would otherwise be difficult to serve by rail. California's connecting bus program is described in detail after the general discussion of northern California services below.

D.2.2 Northern California—Capitol Corridor, the San Joaquin, Caltrain, and the Altamont Commuter Express

There are four distinct passenger rail services in Northern California, two intercity corridors operated by Amtrak and two commuter operations. The intercity corridors are the Capitol Corridor between San Jose, Oakland, and Sacramento, and the San Joaquin Corridor between Oakland and Bakersfield. The Commuter operations are Caltrain between San Francisco and San Jose and the Altamont Commuter Express (ACE) between Stockton and San Jose. The ACE is unusual in that it does not provide service to the core cities of Oakland and San Francisco. Together with connecting bus routes, these services provide a substantial regional network of rail services.

The Capitol Corridor is the name given to the Amtrak operated service between San Jose, through Oakland and Sacramento to Auburn. The entire route is over UP track. The Capitol Corridor did not exist when Amtrak was formed in 1971 and has always been a fully state-supported service. It was initiated in 1991 with direct support for operating expenses and selected capital improvements from California DOT using funds from Proposition 116 rail bonds. Initial service was three round trips daily, increased to four in 1998. The Capital Corridor Joint Powers Authority (CCJPA) was established in 1996 as a partnership of six local transportation agencies to share in the management of the service. CCJPA took over direct management of the service in 1998 and embarked on a vigorous program of route and service improvements. In nearly a decade of CCJPA management, more than $400 million of public funds have been invested in the Corridor, frequency has grown to 16 round trips daily, and ridership has nearly quadrupled from 463,000 in 1998 to 1.76 million in 2008. Over the same period, freight traffic has grown from nine to 28 trains daily. This corridor is one of the best examples in the U.S. of the successful management of a rapidly growing shared freight and passenger corridor on a principal freight railroad main line. The other example is the Cascades service between Seattle, Washington and Portland, Oregon. A more detailed description of the approaches used to build this service on a busy shared corridor is described in a following subsection.

The San Joaquin Corridor between Oakland, Sacramento, and Bakersfield currently (2008) offers six round trips daily, two of which originate in Sacramento and four which originate in

Oakland. The service was initiated with Amtrak funding in 1974, and California DOT has provided funding since 1979, growing from an original single round trip to the present service. Infrastructure investments on this route have been limited, mostly grade crossing improvements. The character of this route is somewhat different from the other two California corridors, being considerably longer with fewer commuters and short-trip business travelers.

Caltrain is the name given to a commuter service between San Francisco and San Jose. This is the only long-standing commuter service operating west of Chicago, and has a history resembling that of the eastern commuter rail systems. Originally operated by the Southern Pacific Railroad, California DOT, with support from local jurisdictions, took over financial responsibility for the service in 1977 to forestall abandonment, retaining Southern Pacific as a contract operator. Service improvements and new equipment followed and the service set on the path to growth. Ten years later, the Peninsular Corridor Study Joint Powers Board (later PCJPB) was established to put the corridor on a sound long-term foundation, leading to purchase of the corridor from Southern Pacific in 1991 for $220 million. "Study" was dropped from the name shortly after. The Southern Pacific and successor UP retain the right to provide freight service along the route. The PCJPB has pursued a continuous program of service improvements to the present day, with infrastructure investments to increase capacity and service reliability, and has added a limited stop express service (the Baby Bullets) and doubled train frequency. Ridership has grown from fewer than 5 million per year in 1991 to nearly 13 million in 2008. Investments in plant and equipment over 16 years have been on the order of $400 million.

The second commuter rail service in the region, the ACE, grew out of a grass-roots effort by local governments to improve transportation in that region of San Joaquin County. County taxpayers voted a $0.005 sales tax for transportation in 1990 and identified the ACE as a top priority. In 1995, a Joint Powers authority, the San Joaquin Regional Rail Commission (SJRRC), was established to implement the rail plan, and using $50 million of sales tax funds and contributions from other local government entities, worked to implement the service. Service started in October 1998 over UP tracks with two trains daily each way. The ACE service was initially viewed as a demonstration project that would be discontinued after 2 years if there was insufficient ridership. Cars and locomotives had been ordered before it was clear that a service could be implemented, on the assumption they could be sold to other agencies if ACE did not continue beyond the demonstration period. The access agreement with UP stipulated that ACE would make capacity investments if the service continued past the demonstration period. These arrangements enabled a low-risk low-cost startup period during which critical public support for heavier expenditures to follow could be built. The service was a success, building to four round trips daily in 2006, with more than 800,000 annual riders in 1998. However, the UP has stated that they will not permit any further increase, citing expected freight traffic growth.

Mention should also be made of Bay Area Rapid Transit (BART) which provides an extensive network of rail rapid transit services in the area, with connections to all the passenger rail services described above. This connectivity greatly expands the potential utility of the passenger rail services.

D.2.3 Capitol Corridor Growth and Service Quality Strategies

Background

Negotiations with SP in 1993–1994 led to an agreement by Caltrans to invest around $57 million in the Oakland–Sacramento alignment, enabling the track to be re-laid with continuous welded rail along with new ties, ballast, and double track. In exchange Caltrans obtained the perpetual right to operate up to twenty passenger train round-trips per day between the two cities. Initial capital work was completed in 1997.

The Capitol Corridor Joint Powers Authority (CCJPA) was established in 1998 to develop and manage passenger rail services from San Jose–Oakland and Oakland–Sacramento. CCJPA is a partnership among the six local transit agencies in the eight-county service area which shares the administration and management of the Capitol Corridor. The San Francisco Bay Area Rapid Transit District (BART) provides day-to-day management support to the CCJPA.

Between 1998 and 2008 service grew from 4 to 16 daily round trips; ridership increased from 462,000 to 1.7 million. Fare box recovery jumped from 30 percent to 53 percent. Improved frequency has boosted ridership per train trip as more potential customers incorporate the service into their travel routines. This is a major factor in increasing revenue per train trip and overall financial performance.

Train operations and compensation to UP are pursuant to Amtrak's national agreement with the carrier. By statute, the operating compensation to freight carriers for Amtrak intercity trains is limited to "avoidable costs" and is not intended to provide an economic return on fixed investment for the route in question. As a result, Capitol Corridor has sought to create a business partnership with the freight owner (SP, and now UP) by participating in a fair but robust sharing of required capital upgrades and improved track maintenance in the Oakland–Sacramento corridor.

Keeping the Trains Moving

One unique aspect of the Capitol Corridor service is a contractual "20/40" rule, wherein the freight carrier is guaranteed a 40-minute window for freight operations following the scheduled movement of a passenger train. From an operations process perspective this protocol appears to work reasonably well in this corridor. Passenger trains, operating at higher speeds but with numerous stops, have an average forward velocity consistent with that of well-powered merchandise freight trains. As will be noted below, track quality standards are maintained above that strictly required for the 79-mph passenger operations and this, in turn, allows freights to move at higher speeds, more flexibly levering train slot availability.

CCJPA observes that one important contributor to the success of their relationship with UP is the delegation of significant operations and liaison authority to UP's local operations executives in Roseville, California. The Vice President of Regional Operations sets the tone for UP's dealings with Amtrak and CCJPA in northern California and has made clear the railway's desire to operate in a pragmatic, problem-solving mode. The frequency of both passenger and freight operations on the shared track requires all parties to perform in a disciplined, predictable fashion to preserve the quality of service for all users. Including the long-distance Coast Starlight, there are now 32 passenger trains and up to 20 freights daily in the Sacramento–Oakland corridor.

Planning the Future

Corridor operations and infrastructure are coded into an RTC (Berkeley Software) modeling platform to test proposals for new service and alternative capital investment scenarios. The ups and downs of public facility capital from year-to-year challenge the CCJPA and UP alike. Rather than continue reacting to "one-off" service proposals the railroad and CCJPA agreed in 2002 to develop a master "Vision Plan" that outlines long-term service goals for the corridor.

Under the Vision Plan structure CCJPA staff develops and delivers a service improvement proposal to UP. UP tests the proposal with RTC modeling, defines needed capital improvements, and develops engineering cost estimates. Construction contracts are then signed under a master Construction and Maintenance Agreement to perform the needed work. Each individual work effort moves the corridor in the direction of the Vision Plan and is required to be consistent with the long-term evolution of the corridor.

The master Construction and Maintenance Agreement enables track improvements to be executed as simple work orders when funds become available. Under the old regime a funding package would have triggered an entire new round of negotiations between the parties. State-funded investments become the property of UP once they are installed; the state, in return, receives a minimum number of train slots and track maintenance guarantees from UP.

The parties have identified specific major bottlenecks that must be addressed at some point in the future for the continued growth of both freight and passenger operations. A Sacramento River bridge crossing just outside the downtown area and a single-span lift bridge crossing San Pablo Bay at Martinez, California will each need to be replaced to accomplish the long-range service goals of the Vision Plan. A collaborative approach to planning and funding of these efforts is essential, deepening the rationale for continued growth in the collaborative structure of the alignment.

Raising the Bar on Maintenance

The impact of irregular service is far greater for passenger and commuter operations than for typical rail freight service. Track used to support freight-only operations is generally programmed to receive major investment every few years, making best use of expensive trackwork equipment and crews by replacing or renewing significant volumes of rail, ties, and ballast over a long section of track. The Capitol Corridor service territory, for example, might be programmed for major work every 5 or 6 years. Service during this renew program would suffer major adjustments, including lengthened schedules, reduced frequencies, and greater likelihood of unplanned delays.

The CCJPA investigated alternative approaches for track maintenance in order to minimize impacts on passenger train service. The new protocol, adopted in 2002, includes an approximately equal volume of work performed each year as opposed to more typical maintenance "blitzes" every few years. Work is generally performed in February and March of each year. This is seasonally a period of surplus track maintenance labor on UP's service network, thanks to winter conditions throughout much of their territory. Fifteen route miles of the Capitol Corridor double-track main are renewed each year.

To minimize service impacts during peak commuter hours, CCJPA proposed a "nighttime only" schedule for track work. UP was successful in negotiating such an arrangement with labor, subject to a $1 per hour labor differential which is passed through to the CCJPA.

Another innovation that supports highly reliable service in the corridor is the practice of maintaining a higher track quality standard than is required by FRA regulation, to support the current 79 mph passenger train speeds. The Federal Railroad Administration (FRA) establishes maximum allowable speeds that are in turn tied to minimum standards for tie, rail, and surface conditions for all carriers. The Capital Corridor had been maintained to FRA Class 4 until 2002 when the new capital and maintenance regime was established. In addition to track work "load leveling" and regular seasonal scheduling of major track renewals, CCJPA agreed to fund an additional 12-month maintenance crew, making possible an upgrade of the route to FRA Class 5. Passenger service speeds remain at 79 mph, but the higher track standard provides a "buffer" against routine defects discovered as part of the regular inspection process. Regular maintenance issues can be addressed as it is convenient to do so without impacting service speeds in the interim. Freight operating speeds have been increased, improving the compatibility of freight and passenger operations during the daylight hours.

Capitol Corridor spokesmen have noted that the entire package of incentives and capital support for the UP-owned alignment has not been cheap, averaging more than $40,000 per track mile per year. High on-time performance, growth of ridership, and improved service frequencies are the rewards of "doing things right" from a facility management perspective in the West Coast's busiest mixed-use corridors.

D.2.4 Use of Bus Connections to Extend the Reach of California's Amtrak Intercity Services

Background

A significant challenge faced by advocates of intercity passenger rail service is the need to draw ridership from broad geographic regions, with clients far dispersed from initial station locations. California, with a large and growing population base, faces this issue as many more sparsely populated areas due to sprawling patterns of development, much of which is beyond comfortable "commute" distances to intercity rail service nodes. Much of Caltrans' success with state-supported rail in its three corridors (Pacific Surfliner, Capitol and San Joaquin) is due to its coordination with connecting modes. Of particular note are the Amtrak-branded, high-quality bus services directly connecting trains.

Connecting the Gaps

Caltrans support for passenger rail service goes back to 1976, with the startup of the first 403b train service over Santa Fe Railway lines between San Diego and Los Angeles (LA). In subsequent years Caltrans acquired additional equipment for the trains, enabling three daily round-trips by 1980. Ridership soared. Today the Pacific Surfliners carry three million annual riders; it is the second most-heavily traveled intercity rail corridor in the country.

In the late 1970s Caltrans also started to provide funding for trains operating in the San Joaquin corridor between Bakersfield and Oakland. This service, operated over Santa Fe Railway tracks, stopped short of key destinations at either end of its route. Passengers wishing to connect northward to Sacramento or south into the LA basin needed a convenient, reliable option for completing their journeys. The rail route south from Bakersfield terminus of the San Joaquin trains to Los Angeles passed over the tortuous but scenic Tehachapi loop, and was very slow and indirect. The lack of a direct connection into LA also meant that San Diego passengers traveling north to the Bay Area lacked good options for continuing their journey beyond LA.

Caltrans addressed the connectivity issue with dedicated, high-quality bus connection services. The first such route connected Los Angeles to Bakersfield which is much quicker than a rail connection over the Tehachapi loop, and continues to account for around 60 percent of all riders on the San Joaquin trains. This initial bus route was considered an essential element of Caltrans' rail service development plan and was put in place without major cost-benefit assessments or justification. The second such service connected San Joaquin riders with Sacramento. Oakland–Sacramento service (the Capitol Corridor) was still several years away.

After the success of these two initial connecting service corridors other routes were initiated on a trial and error basis. Developing such connectors is a relatively low-risk approach to testing market demand without major commitments of long-term resources. Today, ridership assessments incorporating bus connection activity are incorporated into overall Caltrans rail service modeling through agreements with Amtrak. In addition to the "gap filling" role described above, Amtrak-branded bus services extend the effective reach of the intercity network to communities that will never enjoy direct rail service due to cost, right-of-way availability or ridership potential. In other circumstances the buses have proven so successful that investments to provide direct rail are seen as justified and have been incorporated into Caltrans' long-term rail service development plans.

Caltrans works closely with Amtrak to set service standards and secure operating agreements with the various bus service providers providing Amtrak Thruway service. Standards include luxury coach specifications, cleanliness, customer service demeanor, station hygiene, etc. Caltrans pays for 100 percent of the service, including the salaries of Amtrak officers who serve as bus service supervisors. In late 2008, seven bus operators provided dedicated connecting service around the state.

Caltrans surveys of train riders found that many such patrons harbor serious doubts about motor carrier service and are particularly unwilling to contemplate bus rides of more than one hour. For these reasons special effort has been made to brand the buses as "Amtrak connectors." Stations have been designed to support that image and include shade/rain canopies for riders and other amenities. Driver uniforms, name tags, and other symbols further support efforts to overcome any bias against buses and distinguish the connectors from other intercity bus offerings.

The Thruway buses have guaranteed connections to their targeted trains; Caltrans will hold a train departure a reasonable amount of time to ensure that the connection is made. If a connection fails, Caltrans will either put passengers on the next available train or will bus them all the way to their destination.

The relatively short-haul nature of the motor carrier runs supports retention of an experienced and highly qualified labor base; drivers always return home at night, which is often not the case for general intercity bus driver assignments.

Caltrans management views the motor carrier connections as an integral part of the state's intercity service offerings. Total costs and revenues for passengers on both the rail and bus sides of specific trips are combined to assess the viability of a given service. For some heavily traveled "gap filling" routes, such as San Luis Obispo to San Francisco, the apparent overall "operating ratio" of the connecting service is approximately 200 percent.

The Greyhound Growls

Greyhound bus lines successfully lobbied the California legislature to limit perceived competition from Caltrans-contracted bus service, even in those alignments where no common carrier operates today. The restrictions preclude residents from using Caltrans bus services except to connect to or from an Amtrak train; "bus-only" riders are prohibited. The restrictions have effectively eliminated common carrier passenger service of any type in many communities. Local residents have become frustrated when they see Caltrans buses in their communities but are precluded from using them to the next city en route. Caltrans has suggested an alternative protocol that would have Caltrans buses exit any route where a private operator stepped up to offer service, but Greyhound and its lobbyists have held their ground.

Bus riders must tender their Amtrak paper ticket in order to board the throughway service. If a reservation has been made electronically, a rider must surrender his or her driver's license or other secure document. The license will then be returned to them upon boarding the connecting train.

Other Connecting Services

Caltrans also negotiates annual or multi-year inter-agency agreements with seventeen local transit operators around the state. Agreements include coordination protocol for transfer from rail to local transit and some state funding incentives to the local bodies. Success in negotiating these deals is inversely proportional to the size of the local system. No such agreements are in place, for example, with the San Diego or Los Angeles transit agencies.

Scheduling protocol is more critical in smaller communities with bus-centered, long-headway local service. Connections to higher-frequency, fixed route systems such as the Sacramento LRT are less important due to the modest (15 minute) headways between LRT trains. While the integration agreements have worked reasonably well, Caltrans admits there is always room for improvement. Larger local systems view Caltrans, at times, as a competitor for ridership and are sometimes leery of the joint promotion/information aspects of the coordination agreements.

Seamlessness in the South

One major success in local coordination has been the "Rail 2 Rail" agreement negotiated between Caltrans and the Southern California Regional Rail Authority (SCRRA) in 2002. SCRRA is the operator of LA Metrolink, a wide-flung network of commuter rail services, tying distant suburbs to downtown LA. The "Rail 2 Rail" coordination program includes joint advertising, cooperative fare setting, and transferability of tickets purchased for one entity on the services (over the same shared corridor) of the partner agencies. Thus a Metrolink ticket holder traveling south over the shared Surfliner route south of the city can board the Amtrak train if and when it is more convenient to do so. The program has been wildly successful, with around 45,000 monthly pass holders taking advantage of the "Rail 2 Rail" program.

The success of "Rail 2 Rail" on the Metrolink systems prompted the North San Diego County Transit District (NCTD) to follow suit with a similar arrangement in 2004. NCTD operates the popular Coaster trains from Oceanside southward into downtown San Diego.

Another contributor to multi-modal success in southern California and elsewhere is Caltrans' investment in marketing and education campaigns to help the traveling public understand transit connections and alternatives. Website data is comprehensive and easy to use. The "Rail 2 Rail" program has its own dedicated site: www.railtorail.org. More generally, the www.amtrakcalifornia.com site has easy-to-use section headings that index station names and locations as well as all connecting mode information for those destinations.

Complementary service providers have begun to market "rail-specific" packages and have linked their offerings to the site, providing further incentives for residents and visitors alike to try the services. Kimpton Hotels and Marriott have each provided special rates for those taking advantage of Amtrak's service offerings.

Summary

The skeletal geographic nature of intercity passenger rail service in most of the nation implies that coordination with other modes is an essential part of building ridership. Caltrans has demonstrated the potential success of such programs by leveraging a wide range of client education, branding, and service coordination tools. Public transportation leaders have long recognized that the rail mode enjoys special powers of attraction when convincing the public to abandon their private vehicles. Motor carrier extensions of rail service must be therefore carefully branded and managed as a "premium" service offering, distinct from other intercity bus operations.

The overlap of rail services between commuter and intercity trains over shared alignments gives rise to new ways to improve service and ridership. Ticket sharing, joint marketing, and schedule coordination has been shown to build loyalty and ridership. Simplifying rail access dramatically reduces perceived barriers for those new to public transportation. For another example of bus to intercity rail cooperation see Section D.5 on the Downeaster service between Boston, Massachusetts and Portland, Maine.

D.3 Passenger Rail Developments and Processes in the Pacific Northwest

D.3.1 Background

Along with California, the Pacific Northwest region and specifically Washington State has been a pioneer in investing in passenger rail service to provide public transportation alternatives to highway mode. The first initiative described is the Cascades intercity service between Seattle, Washington and Portland, Oregon, with more limited service northward to Vancouver British

Columbia and southward to Eugene, Oregon. The second service is the Sounder commuter rail route from Everett through Seattle to Tacoma, in Washington State. Because both services share the same route, BNSF Railway's main north–south line from Everett through Seattle to Tacoma, Washington, all planning has to include both services as well as BNSF's freight business. A focus of this case study is how Washington State DOT planned and implemented the Cascades intercity service in cooperation with county transportation agencies around Seattle that developed the Sounder commuter service and BNSF Railway.

D.3.2 The Sounder Commuter Rail Service

The Sounder commuter services operate over a 66-mile route from Everett in the north through Seattle to Tacoma in the south. Prior to implementation of the Sounder service attempts to introduce transit alternatives to the Seattle region had floundered, in spite of severe highway congestion. With the constricted geography through Seattle itself, it is almost impossible to expand highway capacity, and voters in the region finally authorized a $3.9 billion funding proposal to improve transit alternatives. In addition to the Sounder service the proposal included light rail between Tacoma, SeaTac Airport and Seattle and bus improvements.

Sounder commuter rail service began in 2000 with two daily round trips on the southern section between Seattle and Tacoma. This service grew steadily to nine round trips by 2009. Service started on the northern section in 2003 after Sound Transit purchased a permanent easement from BNSF Railway for commuter service between Seattle and Everett. The agreement obliges BNSF Railway to provide capacity for a maximum number of commuter trips, to an agreed schedule and trip time, but leaves responsibility for the specific investment in track capacity and quality to meet the performance targets to the BNSF Railway.

South of Seattle route improvements for commuter service were shared with investments for the Cascades intercity service and for State grants to improve freight railroad service, especially to the ports of Seattle and Tacoma and to add capacity on congested main lines to the east. An example of a shared investment was a re-design of the southern approaches to King Street station in Seattle. When Sounder was in the planning stage, the approaches to the station were operated under "yard rules" with hand operated switches and no signals, which added several minutes to the journey time of all trains. A series of improvements included CTC signaling, and a new track layout that could accommodate all passenger services, as well as separating passenger movements as far as possible from through freight trains. In a separate project, King Street station itself is undergoing (2008) a massive renovation. Finally a route extension from Tacoma to Lakeview was under construction in 2008. This segment requires upgrade and partial replacement of a BNSF branch line, and will be further extended to provide a quicker and less congested route for Cascades intercity trains to Portland, Oregon.

The net result from all this effort is that between its inception in 2000 and 2008 ridership on Sounder commuter services grew to 2.67 million.

D.3.3 The Cascades Intercity Service

Increased interest in intercity passenger rail service in Washington State took root in the late 1980s. A modest level of passenger train operations had survived the divestiture of such services by private carriers in 1971, with two daily Seattle–Portland trains and a single daily Coast Starlight between Seattle and Bakersfield serving as the baseline from which improvements could be considered.

In 1991 the State Legislature directed Washington DOT (WSDOT) to conduct a comprehensive feasibility assessment for high speed ground transportation in the state. Concern was growing over congestion on I-5, the main thoroughfare between Portland and Seattle, and demographic/travel

trends confirmed that there was no prospect for adding enough highway capacity to accommodate expected travel between these points.

In 1992 the *High Speed Ground Transportation Study* was delivered to the Governor and the Legislature. In 1993 the legislature directed WSDOT to develop "high quality intercity passenger rail service . . . through incremental upgrading of the existing service". Support for this incremental approach was grounded in a desire to both manage costs and to build, over time, a "rail culture" in the state where intercity rail was seen as an attractive alternative to driving and regional air travel. Revised Code of Washington Chapter 47.79 stands as the cornerstone of rail's inclusion as a vital part of the state's mobility strategy.

This early and high-profile commitment to rail helped Washington and its regional partners obtain designation by the FRA of the route from Eugene, Oregon to Vancouver, British Columbia as one of the original five "High Speed Rail" corridors.

Of equal value in 1993 was a senior-level agreement between then-BNSF CEO Gerry Grinstein and WSDOT Secretary Sid Morrison to proceed cooperatively with long-term planning of improvements. Prior to that point, the speed and success of dealing with the BNSF Railway had been a product of an individual's personal and professional opinions about the merits of shared use. With blessing from the highest levels of management, the state and BNSF began the long and complex process of developing a trusting and transparent business partnership for the I-5 alignment.

A Long-Term View

In 1999 Washington State introduced the first state-owned rolling stock into the Seattle–Portland corridor, and the Amtrak *Cascades* were born. The Talgo train sets employ Spanish "passive tilt" technology, increasing passenger comfort and enabling curves to be navigated at higher speeds, shaving 25 minutes off the original Seattle–Portland schedule. The modern, distinctive trains helped bolster WSDOT's marketing efforts for the service and distinguish the state-supported operation from traditional Amtrak operations.

From the earliest days WSDOT had understood the need to embed service improvements within the context of a long-term vision. The current version of the long-term plan includes detailed rolling stock, transit time, operating speed, ridership, and financial data for the *Cascades* through 2023; it is readily accessible on the WSDOT Web site. The vision plan is seen as a living document and includes a regular, disciplined schedule of review and plan updates.

It should also be noted that the plan is financially unconstrained, describing in detail the sequence of improvements required in support of a robust system while acknowledging that the suggested timing of events are simply "placeholder" dates to be adjusted as financing from state, federal, or private sources becomes available.

Development of the long-term plan did not come cheaply or easily, but the resulting "framework agreement" has supported a maturing of the relationship between the state and BNSF as well as faster execution of real, physical improvements that deliver benefits to train riders and freight operations alike. WSDOT has staffed its rail functions to support its pro-active approach to rail—nearly two dozen engineering, planning, economic evaluation, and public agency liaison professionals carry forward the state's passenger and freight rail agenda.

Modeling Maneuvers

Modeling of freight and passenger operations for the *Cascades* corridor has evolved to a collaborative, one-shop exercise as levels of trust and transparency have grown between the partners. Initially, WSDOT hired its own consulting experts to model operations and capacity needs, while BNSF (though using the same software) employed its own experts. Considerable energy was then expended in probing the inevitable differences between the two assessments. Today the service

and capacity profiles are updated with full transparency of inputs and outputs for all parties with shared funding of technical work. Each party has an enhanced understanding of the impacts for alternative investment scenarios and the complementary impacts on other corridor users. One challenge of the capacity assessment has been a perpetual trackage rights agreement held by UP over BNSF's Portland–Seattle line. Much of the growth in freight traffic has been for the UP account as a complement to UP's proprietary I-5 alignment from Portland to the LA Basin.

Shared long-term modeling of the *Cascades* led to recognition by both BNSF and the state of need for a dedicated, passenger-only third main track south of Tacoma in the latter years of the Vision Plan. Service scenarios had been programmed into the three track model under both "all users, all tracks" and assuming a dedicated passenger main; technical outputs on service and cost confirmed a clear advantage for the dedicated track. An investment and ownership decision that could well have become an acrimonious policy conflict was instead resolved through an objective, technically driven investigation.

Timing for construction of the new third-track configuration remains uncertain, but the speed and frequency drivers that would trigger this investment are well understood by all stakeholders. In this way the Washington State corridor vision is unique, accommodating both a medium-term traditional shared use investment regime with recognition of its limits and a future need for segregated track. Investing in the formal analysis required to support long-term enhancements builds trust for freight and passenger stakeholders and permits enhancements to be put in place more quickly once financing sources are accessible to the project sponsors.

An important advantage of the years of careful planning became apparent in 2008 with the passage of PRIIA and ARRA. Washington State is in a good position to compete for funding under this legislation with a well-founded long-term plan and excellent relations with the host railroad.

Freight as a Factor

Another key element of Washington's success in rail planning for the *Cascades* has been the simultaneous attention to rail freight mobility issues around the state, both within and external to the I-5 alignment. Traditional, resource-based industries such as mining and forestry as well as the position of the Puget Sound ports in booming Asian trade heavily depend upon reliable freight service, primarily via BNSF. WSDOT's freight rail assistance program is robust, well-established, and a respected element of the state's good mobility strategy.

Of particular importance to the I-5 alignment is the state's Free and Secure Transit (FAST) cross-border program, designed to speed the movement of freight through the central Puget Sound region. Rail improvements funded through this program have improved access of rail freight providers to the ports of Tacoma and Seattle as well as furtherance to points east. As an example, WSDOT played a supportive role in BNSF's decision to re-open a dormant alternative rail crossing route over the Cascades via Stampede Pass in 1996.

An underlying theme is the acknowledgement and understanding of rail freight issues and challenges as part of WSDOT's overall transportation agenda. Progress on passenger rail issues is easier to achieve when the negotiations arena includes potential gains for the host carrier's core business interests.

Outcomes

The results of these efforts were that Amtrak and WSDOT were able to increase the number of round trips between Seattle, Washington and Portland, Oregon from the one round trip in Amtrak's core service network to four round trips in 2008, exclusive of the daily Coast Starlight long distance train to and from Los Angeles. In addition service was extended to two round trips from Seattle to Vancouver British Columbia and three round trips from Portland to Eugene,

Oregon, supported by the state of Oregon. Five Spanish Talgo train sets were acquired by Amtrak and WSDOT in the late 1990s providing shorter journey times and generally improving attractiveness to passengers. The extensive infrastructure investments plus the use of the Talgos enabled journey time from Seattle to Portland to be reduced from 3h 55m before the start of the program to 3h 30m in 2008. Ridership on the Cascades corridor grew from 94,000 in 2003 to 530,000 in 2000 and approximately 850,000 in 2008.

D.4 Passenger Rail Service Quality Monitoring on the Chicago Commuter Network

D.4.1 Background

Chicago has the most extensive commuter rail network outside of the large east coast systems. Most of these lines have been in operation for decades, and were originally operated by the numerous individual railroads that served Chicago. As with the east coast systems, facilities, equipment and service declined in the 1960s and early 1970s, as the profitability of the freight business declined and railroads neglected and sought to abandon passenger services. To preserve service, the State of Illinois created the Regional Transportation Authority (RTA) in 1974 with powers to levy a local tax in a six-county region around Chicago to support rail service under "purchase of service" agreements with the railroads. Indiana created a similar authority, the Northern Indiana Commuter Transportation District (NICTD) in 1977 to rescue the South Shore service to South Bend and Michigan City from abandonment. These actions helped, but difficulties continued with the bankruptcy of the Rock Island and Milwaukee Road. Milwaukee Road lines in the Chicago area continued to operate in bankruptcy, until they were purchased by the Soo Line (owned by Canadian Pacific), but the Rock Island was liquidated. After a short period of operation by the Chicago Northwestern Railroad, RTA purchased the Rock Island lines and created an operating railroad, the Northeastern Illinois Railroad Corporation (NIRC) to manage operations. In 1983, Metropolitan Rail (METRA) was established as a management and marketing agency under RTA, with NIRC being responsible for providing all METRA's directly operated services. The electrified commuter routes formerly operated by the Illinois Central railroad were acquired by RTA in 1987 and operations were also transferred to NIRC.

The rail services have continued to evolve over the following 25 years with substantial investment by RTA/METRA in new equipment, higher frequency service, and line extensions. Most notably, an entirely new route started service in 1996, the North Central service from Chicago to Antioch over the Wisconsin Central. Initially this was a low-budget initiative, costing $61 million for the 53-mile route (partly over an existing passenger route), with station costs born by en-route communities. Continuing success led to a further substantial investment in 2006 with additional stations and track investment to support higher frequency and mixed express and local trips. Also during this period, METRA had to respond to changes of ownership on most of the rail lines in the region, following mergers and line sales in the railroad industry. These changes are best summarized in Table D-1 for each route, listed counter clockwise from the northeast.

Two more new lines are in active development, one of which is a circumferential line joining suburbs north and west of Chicago. As well a METRA-specific projects, there is a 1.5 billion railroad investment program in progress in Chicago called CREATE (Chicago Region Environmental and Transportation Efficiency Program). CREATE is a partnership of the State of Illinois, City of Chicago, METRA, and the freight railroads to eliminate railroad bottlenecks and increase capacity of the Chicago railroad network to the benefit of both freight and passenger services. Investments are concentrated on five corridors that link all the railroads entering Chicago, and include rail-to-rail grade separations, grade crossing elimination, new connections between lines, additional track, and improved traffic control systems.

Table D-1. Chicago area rail line current operators, ownership and maintenance, dispatching, and ownership history.

Route (railroad) Destination	Train Operations	Track Owner/ Maintenance	Dispatching	History Since Mid-1970s
Union Pacific North to Kenosha	UP	UP/UP	UP	CNW until 1995
North Central to Antioch	METRA/NIRC	CN	CN	Opened 1996 Host Wisconsin Central to 2001, then CN
Milwaukee District North to Fox Lake	METRA-NIRC	METRA/CP Rail	CP Rail	Milwaukee Road until 1982, then SOO line and CP
Union Pacific Northwest to Harvard and Mc Henry	UP	UP/UP	UP	CNW until 1995
Milwaukee District West to Big Timber	METRA-NIRC	METRA/CP Rail	CP Rail	Milwaukee Road until 1982, then SOO line and CP
Union Pacific West to Elburn	UP	UP/UP	UP	CNW until 1995
BNSF to Aurora	BNSF	BNSF/BNSF	BNSF	Burlington Northern to 1996
Heritage Corridor to Joliet	METRA-NIRC	CN/CN (ex-IC)	CN (ex-IC)	IC until 1999 (?) then CN
Southwest Service to Manhattan	METRA (NIRC)	NS, Leased to METRA/METRA	NS	Norfolk and Western to 1982, then NS
Rock Island District to Joliet	METRA (NIRC)	METRA/METRA (NIRC)	METRA (NIRC)	Rock Island until 1980, CNW 1980–1982 then METRA
METRA Electric To University Park	NETRA (NIRC)	METRA/METRA (NIRC)	METRA (NIRC)	IC and ICG until 1987
South Shore to Michigan City	NICTD	NICTD/NICTD	NICTD	South Shore until 1989

Unusually, several commuter routes continued to be operated by the host freight railroads, most notably by BNSF Railway (formerly BN) and by the UP (formerly the Chicago Northwestern). This is because the lines were also busy freight corridors and the host freight railroads preferred to have full control of all operations to ensure good service for both freight and passenger customers. BNSF Railway has been particularly active in seeking methods to ensure good service, and this case study presents the BNSF approach as a good example of service management. It should be noted that the approach described in the following paragraphs is not unique, nor is the Guidebook endorsing the approach as the only recommended approach. Rather the objective is to emphasize that good service does not just happen: both the host railroad and train operator must have a structured process to manage performance.

D.4.2 The BNSF Approach

Management gurus often tout the adage that "you cannot manage what you cannot measure," and this is nowhere more true than in the railroad industry. The complexity of operations, the interface of 15–20 work disciplines and day-to-day changes in demand for services add up to a challenging world for even the most seasoned operations managers. These challenges are magnified when a corridor is shared between two or more parties, each with their own sets of priorities and expectations.

BNSF Railway is a leading North American organization in setting standards for service performance measurement. This expertise, applied to both commuter and intercity passenger rail

service over BNSF Railway's lines, has proven invaluable as a foundation for process improvements, allocation of capital, and robust on-time service delivery. These measures, coupled with a culture that values transparency with business and service partners, move the overall management of shared corridors away from "vendor/purchaser" paradigms and into a world where each partner understands and shoulders their role in the success of the operation.

D.4.3 Program Development

In 1995 Chris Green, Executive Director of British Rail met with BNSF staff to describe a number of service improvement initiatives then underway on the British Rail's services in the United Kingdom. Much of this effort centered on capturing delay information and then assigning individual events into discreet "root cause" categories. Delay data was then aggregated in a manner that would support capital budgeting for the upcoming year. Recurring delays that relate to personnel or policy issues are similarly laid bare through this process, as are associated remedies that may or may not require new investment or operations expense.

BNSF followed the British Rail example in developing its own structure of delay assignment and analysis. The BNSF delay includes nineteen categories:

1. Accident
2. ADA Car
3. Amtrak interference (equipment failure, staff positioning, etc.)
4. Amtrak Chicago Union Station operations
5. Subdivision Congestion
6. Freight Delays
7. Human Error
8. Mechanical, locomotive
9. Mechanical, car
10. Maintenance of Way (unplanned)
11. Maintenance of Way (planned)
12. Other
13. Passenger handling
14. Signal Malfunctions
15. Signal – Broken Grade Crossing Gates
16. Telecommunications
17. Centralized Traffic Control
18. Switch
19. Weather

Note that the BNSF Railway operated commuter service in Chicago terminates in Union Station, which is owned and operated by Amtrak.

A 5-year historic review of delays by category isolated key targets for improvement and helped establish a "delay budget" that benchmarked the overall levels of service integrity the railway might realistically achieve with a strong focus on the "root cause" issues. The initial target was 95–96 percent on-time performance. Total expected delays were then allocated to various internal and partner stakeholder groups, giving managers for those areas (for the first time) a very specific limit on the acceptable number incidents that would impact operations from their areas of responsibility.

Heightened operations measurement and control yielded some unexpected benefits, extending well beyond the limits of shared-use passenger corridors:

- Spikes in winter season turnout failures led to identification of switch heater flaws and a need to re-design the associated blower units. The same issue was in play across the entire network where such heaters were used, but was first identified in the shared-use territory.

- Switch audits became coordinated between the signaling and track maintenance forces, improving field efficiency and building a more robust regimen of winter preparedness activity.
- Signaling system failure impacts led to an emphasis on "scalable" signaling control architecture, wherein signals for one line of a double main system may remain active even as repairs or maintenance are performed on signals for the adjoining track.
- Comprehensive reporting of accident impacts arms BNSF and passenger rail agency representatives with solid data for public meetings, presentations, and right-of-way security initiatives.

A decade of detailed "root cause" assignments for service delay has created a solid foundation from which BNSF may work with public rail authorities on the specific upgrade designs and features that make possible high levels of service integrity for all users of a given corridor. Specific empirical data from existing operations is combined with detailed service modeling (using the Berkeley Software platform) to develop the final plan. Chicago-area experience in particular was used to inform work in the Pacific Northwest region for the startup of BNSF-operated Sounder commuter rail operations:

- The location of maintenance facilities and wash tracks are carefully chosen to minimize interference with through operations. This generally includes co-locating multiple service activities and placing such support infrastructure on one side only of the through corridor.
- Robust investment in bypass routes in and around major freight terminals. Terminal operations have long been recognized as the "Achilles heel" of strategies to improve the service reliability of carload freight. It is not surprising, then, that new trackage specifically dedicated to isolation of passenger operations from these choke points is a high priority for development of reliable passenger operations.

It might be noted that on-time performance for commuter rail services in major communities served by BNSF (Seattle, LA, and Chicago) has ranked in the high 90 percent range for the past few years, due in no small part to the service performance measurement/delay assignment architecture and the careful channeling of capital improvement funds.

BNSF has an open-book strategy for dealing with public agencies. Delay assignment and service performance data is shared openly with all stakeholders along with corollary recommendations and rationale for capital investments. When an agency approaches BNSF with a proposal for passenger service, BNSF encourages the agency to speak with other commuter rail operators and members of the APTA Commuter Rail Committee. When a pattern of service failures emerges, BNSF dispatches ground personnel to engage with local agency and BNSF operations personnel. Potential solutions are discussed with operations, signaling, engineering, and dispatch personnel and then tested with an operations model for the corridor in question. The on-the-ground assessment, technical validation, and transparent engagement with passenger service authorities builds trust and understanding that will speed resolution of future such challenges. The state or agency understands the problem, is engaged in the service diagnosis and supports the proposed solution.

Passenger rail agencies are under great pressure to reduce startup capital investment as well as meet federal cost-effectiveness criteria where the FTA New Starts money is involved. In the associated corridor modeling, train dispatchers may be assumed to always make best use of available "slots," mechanical breakdowns are rare, and "all of the employees are above average." Analyses such as those described in this Appendix can be used to ensure that assumptions used in analysis reflect real-world variability and challenges, and are informed by the detailed service performance data collected in comparable service environments.

BNSF's service performance measurement regime has strengthened the carrier's multidisciplinary approach to passenger operations and shared use. The core team of engineering, operations, service modeling, and signaling experts are capable of leveraging past experience to inform their prescription of requirements for new shared service areas while dealing from a solid

foundation of empirical service data. Traditional shared use negotiations would often resemble a football scrimmage, with competing teams of "experts" lobbing anecdotes back and forth across the table to validate their position on a specific investment or upgrade. Developing solutions based on solid technical service data may be less dramatic (and may even take as much time) but the end result builds the working relations and partnerships required to sustain the shared enterprise for the long haul.

D.5 Development of a Short Interstate Passenger Rail Corridor—The Downeaster Service

D.5.1 Background

Proponents of new intercity passenger services often confront the challenge of corridors that cross state lines, complicating efforts to raise capital and gain the support of citizens and legislators in multiple jurisdictions. The resounding success of the Boston to Portland Downeaster service can serve as an example to states and agencies whose resources, demographics and political environment might lead to an early conclusion that passenger rail simply will not work.

Key success factors supporting the Downeaster include:

- An organizational structure that affords considerable autonomy and flexibility to the sponsoring agency
- Support from Federal agencies and the STB in particular to overcome protracted initial opposition from the host carrier, together with consistent support from Maine officials and legislature
- Far-reaching grass roots support among local communities along the route. In some ways the Downeaster might be viewed as America's "most populist" intercity train service.
- A business-centered service philosophy that levers Amtrak's significant institutional advantages while continuing to engage local stakeholders.
- Careful control of the communications process, avoiding press-driven escalation of inevitable conflicts over service performance, costs and shared-asset issues. Significant time and energy is expended in regular, detailed interaction among all stakeholder groups.
- An unwavering focus on the service itself: speed, frequency and reliability. Planning centers on what will be required to improve service with or without "equitable" cost sharing by each of the three states involved in the route.

D.5.2 An Unlikely Corridor

The Downeaster service, initiated in late 2001, operated by the Northern New England Passenger Rail Authority (NNEPRA), operates over the multi-state rail corridor between Boston, Massachusetts and Portland Maine, with a planned extension to Brunswick ME approaching implementation. The Boston–Portland corridor is 120 miles long plus 30 miles for the planned extension to Brunswick, Maine. The Downeaster service is unique for many reasons, including:

- It serves communities in three states, it provides valuable pointers for others considering passenger rail service through multiple states.
- The service was implemented and is operated with a relatively limited budget, an example of how a passenger rail service can be developed by relatively small states that cannot afford the levels of funding typically available to larger states.
- The service has been successful, attracting a growing ridership, especially in recent years, as well as increasing the fraction of operating costs covered by farebox revenues.

Lessons may be drawn from the Downeaster success, particularly with regard to managing the complex web of stakeholders typically engaged in the development of an intercity corridor. For the Downeaster, these included:

- State governments and legislatures of Maine, New Hampshire, and Massachusetts.
- Railroad service operators, including Pan Am Railways (formerly Guilford Rail System and Boston and Maine Railroad), Massachusetts Bay Transportation Authority (MBTA), and Amtrak (the operator of the Downeaster).
- Communities along the route that host passenger rail stations. From north to south these are Portland, Old Orchard Beach (seasonal), Saco and Wells in Maine, Dover, Durham and Exeter in New Hampshire, and Haverhill and Woburn in Massachusetts. Freeport and Brunswick Maine would be served by the Brunswick extension.
- Advocacy groups such as TrainRiders Northeast and the Bicycle Coalition of Maine.

The following sections describe the development of the Downeaster service, the roles played by the various stakeholders, and the approach taken to managing the service.

D.5.3 Downeaster Chronology

The key milestones in the origin, implementation, and continued operation of the Downeaster are listed below. The name of the freight railroad that owns the tracks over which the Downeaster operates changed from Guilford Rail System to Pan Am Railways in March 2006. The following items use the name used by the railroad at the time of the event listed.

1989: The advocacy group TrainRiders Northeast was formed with the objective of promoting passenger rail services in Maine and more generally throughout northern New England. The initial objective was a service between Boston and Portland. There had been no passenger rail service in Maine since 1965, except for a VIA–Rail Canada that passed through northern Maine en route between Montreal and Halifax.

July 1991: Strong support for a Maine citizens mandate directing the state government to implement passenger rail services in Maine encouraged the legislature to adopt the initiative before it came to a vote. In part, support for this mandate was driven by opposition to a proposed widening of the Maine Turnpike from two lanes to three between York and Portland, parallel to the proposed Boston–Portland rail service.

1991–1994: Engineering and environmental studies and assembly of a funding package to upgrade tracks of the Guilford Rail System from the Massachusetts/New Hampshire border occurred. Individual towns and cities developed plans for station locations and facilities. Amtrak offered to make available the two train sets needed for the service.

1995: NNEPRA formed to take financial and management responsibility for implementation and operation of the Downeaster service.

1996–1998: Prolonged legal disputes with Guilford Rail System as to applicability of Amtrak access rights to this service, compensation for passenger train operation, allowable speeds, and related issues. These are fully documented in Appendix A, describing Amtrak rights and responsibilities.

January 1999: Work started on track and right-of-way improvements to the 75 route miles from the Massachusetts/New Hampshire border to Portland, Maine. Work continued for three construction seasons, with a total cost of about $64 million ($850,000 per mile).

December 14, 2001: Inaugural run of the Downeaster. Speeds were limited to 60 mph pending resolution by the STB and the FRA of a dispute with Guilford as to the adequacy of 115 lb/yd rail for 79 mph operation.

Summer 2004: Substantial service delays occur due to a collapsed bridge abutment in Kennebunk.

August 2004: Final resolution of speed dispute is reached with Guilford by the STB. Maximum speed raised to 79 mph, with corresponding reductions in journey time.

September 2004: Service shut down for two weeks for Democratic National Convention in Boston, held adjacent to the Downeaster's Boston terminal at North Station.

August 2007: Fifth round trip added, after extensive delays due to efforts in New Hampshire to secure Congestion, Mitigation, and Air Quality Improvement Program (CMAQ) funds for a contribution to an additional passing siding near Exeter, which was needed to operate the trip reliably. There was considerable opposition in New Hampshire to this use of CMAQ funds by parties preferring alternative projects. It is not clear whether funding the rail projects actually affected the chance that other projects would qualify for funding. A new and effective agreement to coordinate ticketing and schedules with bus operator C&J, which runs a Dover to Boston service, was a factor in overcoming the opposition.

April 2008: Maine legislature allocates $2.5 million per year from car rental tax funds to supporting the extension of Downeaster service to Brunswick Maine, a distance of 29 miles. NNEPRA is pursuing a Railroad Rehabilitation and Improvement Financing Program (RRIF) loan of $31.5 million to fund track upgrades for this extension. Pan Am Railways agreed to complete the work for a fixed price plus adjustments for material costs. The planned initial service to Brunswick can be provided with the existing train sets and crews.

April 2008: Additional car made available by Amtrak to be added to each train set when required by expected ridership levels.

The results of all these efforts are illustrated by the ridership history of the Downeaster, given in Table D-2.

The background to this history can be summarized as follows:

- Good ridership in the first several months of the service can be partly attributed to a novelty effect.
- Flat ridership during the next 2 years can be attributed to long journey times due to a 60 mph maximum speed, the economic downturn after 9/11, and continuing work to complete track upgrades and station projects.
- Lack of growth persisted through the second half of 2004 because of the Kennebunk bridge failure and a service shutdown for the Democratic National Convention in Boston.
- From 2005, ridership grew rapidly, with completion of improvement projects, no serious service interruptions, and schedule refinements.

Table D-2. Downeaster service ridership from 2001 through 2009.

Reporting Year[1]	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
Ridership (1000s)	165[2]	260	255	250	330	346	442	455[3]
Percent Change	na	na	–2%	–2%	+32%	+5%	+28%	na

[1] Reporting years run from July to June to coincide with State of Maine fiscal years.
[2] For 6.5 months. Service started in December 2001.
[3] Estimated.

- Further boost in ridership in 2007–2008 with the addition of a fifth round trip and increasing fuel prices.

This history indicates that the public will use the train if good quality service is delivered—consistent, reliable, free of serious interruptions, and with a reasonable journey time. However, it requires constant attention to detail on the part of multiple entities involved in delivering the service.

D.5.4 The Northern New England Passenger Rail Authority (NNEPRA)

The NNEPRA was created by the State of Maine in 1995 to take financial and management responsibility for the implementation and operation of Downeaster service. New Hampshire was uninterested in passenger rail at the time and opposed providing or soliciting funding, so NH participation in NNEPRA was not considered. The autonomy of this small agency supported a more flexible negotiations style with Amtrak, Pan Am Railways, and other providers of materials and services, moving forward in a complex negotiations environment. NNEPRA is purely a Maine agency; it has no representation from the other states along the Downeaster route. NNEPRA's current functions include:

- Working with Maine DOT and other State of Maine government agencies, and the legislature, to prepare applications for grants, loans, and appropriations to support capital projects and ongoing passenger rail operations.
- Contract with Amtrak for the operation of the Downeaster. Amtrak in turn contracts with Pan Am Railways and MBTA for track usage rights and access to MBTA stations. Amtrak also provides the cars and locomotives used in the service, car, and locomotive maintenance, train crews, and ticketing and reservation services. The contract is a fixed formula (including escalation factors), except for fuel costs and host railroad payments. Amtrak is guaranteed these payments, independent of ticket sales revenues. Amtrak subtracts ticket revenues from the operating expense and bills NNEPRA for the difference.
- Contract with Pan Am Railways and others to implement capital projects, and monitor project progress against schedule and budget.
- Participate in the choice of an independent firm to provide food service aboard the Downeaster and in the choice of food offerings.
- Exercise responsibility for all actions related to designing and regional marketing the Downeaster service, deciding what capacity to offer, and setting fares. This NNEPRA is fully responsible for the revenue side of the service and free to take any and all actions to maximize revenue. NNEPRA carefully manages revenue and expenses within the annual budgets agreed upon with Maine DOT and the legislature, as an essential step to maintain credibility and build trust for continued support in the future.

D.5.5 Early Negotiations and Service Startup

The effort to reintroduce passenger rail service to Maine had a good start with firm support from the public, the state legislature, Amtrak, and the Congressional delegation at the time. Funding was secured and the necessary permitting was put in place, and Amtrak undertook to provide two train sets to operate the planned service. There was also enthusiastic support from municipalities along the route, both in New Hampshire and Maine, which immediately started making plans for developing stations and transportation centers linked to the proposed service. Finally, the Sunday River ski resort owners started a weekend ski-train service between Portland and Bethel, Maine over the St. Lawrence and Atlantic Railroad, which they hoped could connect with the new service to Boston.

Difficulties started when NNEPRA, Amtrak, and State DOT officials approached the railroads over which the service was to operate to negotiate the access agreements, and with Guilford, details

of the track upgrade work. It is clear from contemporary reports and later recounting of the situations that developed, that this process was frustrating for all concerned. The factors that seem to have fed this frustration include:

- Stonewalling by Guilford Rail System, which threw up numerous legal roadblocks to implementing the service, each one of which had to be opposed and overcome by appeals to the STB and the courts. It is not clear that the public officials appreciated that behind the confrontational tactics lay the legitimate concerns that all freight railroads have, that hosting a passenger operation will limit their freedom to grow and adapt the freight service to meet customer needs. In this case, the attitudes of the Guilford management at the time were such that legal fights were probably inevitable, regardless of the approach taken by public officials.
- Expectations by many stakeholders (en-route municipalities, public advocacy groups, public at large) that once funding was secured, all that needed to be done was to carry out the track upgrades. There was a presumption that with Amtrak's right of access and the funding in place, the freight railroad would simply get on with the work. This presumption may have been shared by the public officials. Municipalities and communities expecting to host a station had to put their plans on hold. Advocacy groups and editorial writers in local newspapers expressed their frustrations in print, often critical of Guilford, Maine DOT officials, and the general progress.
- Missteps in negotiations with MBTA about access over their track from Haverhill, Massachusetts to Boston North Station, primarily relating to the issue of capacity on some single track sections of route and in the North Station area during peak hours. NNEPRA had no funds for capacity improvements in MBTA territory, but was arguing for more flexibility in scheduling than MBTA was prepared to grant at the time. Access to MBTA track relied on Amtrak's right of access privileges.
- A general lack of interest in this rail service on the part of New Hampshire officials, and active opposition in some quarters. Part of the opposition originated with the operator of the C&J bus service between Dover and Boston, who viewed the rail service as unfairly subsidized competition and actively lobbied New Hampshire legislators and officials to oppose funding for the train service. However, municipalities hosting stations were able to obtain funding for station area developments such as platforms, shelters and parking lots. Maine had to raise funds for track improvements to the New Hampshire portion of the route.
- Once construction had started, use of "time and materials" contracts for work by the railroad proved cumbersome, leading to a lot of paperwork and a tendency for NNEPRA to micromanage construction and quibble about details. With this experience, NNEPRA later moved to fixed price contracts for an agreed scope of work, with escalation clauses for materials costs.

In spite of these difficulties, construction work was largely complete by the end of the 2001 work season, and operations with four round trips daily started in December 2001.

D.5.6 Service Development Since Startup

After a spike in the first season of operation, attributed to the novelty effect of a new service, there was little growth in ridership in the first 3 years of operation, through late 2004. Ridership was also significantly below pre-service forecasts. Reasons for low ridership included:

- Extended trip times due to the 60 mph speed limit imposed by Guilford. The limit was finally increased to 79 mph in August 2004, after all Guilford's objections were overcome.
- Ongoing work to complete outstanding track improvement projects, which also lengthened journey times.
- Scheduling that was not well suited to customer requirements, partly due to operating constraints imposed by host railroads, and partly due to NNEPRA's other priorities at the time. The relatively late arrival of the first morning train in Boston and the early departure of the last train of the day were often mentioned as a factor.

With most of the earlier problems resolved and speeds increased to 79 mph, ridership grew rapidly in 2005 and later. A marketing coordinator with travel industry experience appointed in mid 2005 helped to focus marketing efforts and identify the keys to growing ridership

In the period from its founding to 2004, NNEPRA focused on getting the train service up and running with less focus on refining the service. Some stakeholders may have felt neglected or taken for granted, if they were not involved in the immediate problems. Finally, the lackluster ridership threatened to increase the need for operating funds. Federal government CMAQ funding provided operating support in the early years, but in 2009 this support will have to be replaced by state and local funds. The funding request would be a hard sell with the state legislature, if there was a growing gap between expenses and revenue.

The approach taken by NNEPRA is to view the Downeaster service as a business. Both the present executive Director of NNEPRA and the Board have a largely business background. The business succeeds if it attracts riders and earns revenue that meets or exceeds plans and expectations. This success indicates that the service delivers on the expectations of the public and stakeholders in Maine and New Hampshire and the local, state, and federal government agencies which supported and funded the service. It also creates a favorable climate for future growth of passenger rail service in the region.

The service characteristics that attract ridership are well known: convenient schedules, consistent and reliable service, clean and attractive trains, good on-board amenities, and convenient access to services, both physical access at stations and with connecting services and access to information about the service. NNEPRA succeeds in delivering on these service requirements through a mixture of local choice of some service elements and carefully nurturing partnerships with other stakeholders to deliver on the others. Specific approaches follow.

Scheduling

Convenient schedules have been delivered by working on the relationships with the host railroads and Amtrak. The host railroads have become familiar with the operation and have been more flexible in considering schedule requests. NNEPRA holds regular meetings with the railroads to review any operational issues and to explore schedule changes when required. NNEPRA reassures the hosts that it respects their need to serve their primary business needs, and works constructively and co-operatively to understand those needs and find solutions that meet the needs of Downeaster service without interfering with the host railroads' activities. NNEPRA also makes a point of meeting regularly, even when there are no pressing concerns. Good relationships must be built before problems arise in order to encourage support from stakeholders when it is needed.

Service Reliability

The same cooperative relationship with the host railroads and Amtrak yields service reliability, although some problems are beyond immediate control. If a problem is identified that can be corrected with a minor schedule change, this can be done. If a modest infrastructure investment will correct a source of unreliability, then NNEPRA is willing to seek funds to help address the problem. In the case of a major problem that is outside NNEPRA control, it will do all it can to advise its customers, make temporary schedule changes if appropriate, and take similar actions to minimize impact on its business. As a recent example, major structural work on a large bridge spanning the Merrimac River near Boston was well-publicized to Downeaster customers along with expected impacts to train schedules and performance.

Shorter Journey Times

From a longer term perspective, NNEPRA identifies opportunities to shorten the overall journey time between Portland and Boston, and to take advantage of federal grant programs to realize these opportunities. For example, NNEPRA obtained a $500,000 grant from the FRA fiscal

year 2008 grant program toward Portland area track improvements. A fifth daily round trip was also added in 2007. An important constraint at present is that NNEPRA cannot consider funding infrastructure improvements on MBTA territory and has to work around capacity constraints on some single track sections and in the North Station area in Boston.

Trains and On-board Amenities

For trains and on-board amenities, NNEPRA relies on Amtrak-provided equipment and has no plans to acquire its own vehicles. NNEPRA is very involved in the choice of cleaning services and arrangements with a private firm for on-board food service. The food service has been very well received, and although it operates at a loss it is considered an essential amenity to attract ridership.

Access to Stations and Information

NNEPRA relies heavily on partnerships for physical access to stations and for access to information about the service. These relationships include:

- Strong relationships with the six municipalities in New Hampshire and Maine that host passenger stations, including Old Orchard Beach (seasonal), Saco and Wells in Maine, and Dover, Durham and Exeter in New Hampshire. All the municipalities have invested heavily in stations, using local, state, and grant funding, and have linked other transportation and property developments to the stations. For example, in Saco, station improvements are linked to commercial and residential redevelopment of nearby old mill buildings, and have even included a 75 kW windmill. In Durham, the recently renovated station and transportation is close to the University of New Hampshire campus, and connects to the extensive bus service operated by the University. The partnerships are nurtured by bi-monthly meetings between NNEPRA staff and municipal representatives, hosted by the municipalities on a rotating basis.
- The advocacy group partners help with marketing and support future rail developments. They are also not shy about speaking out when events are not to their liking. Examples of activities by these groups include a volunteer on-train and station host program organized by TrainRiders Northeast, and rail-facilitated bicycle touring events organized by the Bicycle Coalition of Maine.
- Key partnerships have been developed with two regional intercity bus operators. Concord Coach operates services from Boston through Portland (sharing a terminal with the Downeaster) to major inland and coastal Maine communities beyond Portland. C&J Bus Lines, an early opponent of the Downeaster, now provides coordinating service between southeastern New Hampshire towns and Boston. Arrangements include ticket interchangeability on selected parallel services and showing each others' services in schedules. Experience has shown that parallel bus and rail services help each others' ridership by providing more travel options rather than competing for a fixed number of travelers.
- NNEPRA relies heavily on Amtrak for a number of services. As the operator of the service Amtrak has the primary relationship with host railroads and is responsible for day-to-day operations. NNEPRA is only involved if there is a systematic problem that may require negotiation of schedule changes, and investment or similar action. NNEPRA relies on the Amtrak national brand for marketing beyond the local area and for the reservation system. NNEPRA provides the Downeaster Web site and local marketing.

Interstate Relationships

Interstate relations proved to be a minor factor in developing and operating the Downeaster service. In Massachusetts, the MBTA is a host railroad on a similar basis to other host railroads over which Amtrak operates service. Massachusetts transportation agencies are not involved with the Downeaster beyond this role and have other pressing issues to address.

Until recently, New Hampshire state transportation agencies and legislators had little interest in passenger rail transportation and would not contribute any funding or apply for grants to sup-

port the service. NNEPRA and the State of Maine did everything, except the activities undertaken by towns along the route. Since 2006, however, there has been a change in attitude. Opposition from the bus operator C&J ended with an agreement to cooperate on ticket interchangeability and scheduling. New Hampshire contributed the cost of a passing siding in Exeter needed for a fifth daily round trip from CMAQ funds. Overtures have been made about a contribution to annual operating costs, when these become a state responsibility in 2009, but there has been no agreement. New Hampshire has appointed an official responsible for passenger rail within the state DOT, but primary interest is centered on extending commuter rail service from Lowell and/or Lawrence, Massachusetts to Manchester, rather than the Downeaster route.

Observations and Summary

Developing a new passenger rail service is a lengthy and complex process requiring the participation of many parties. Not all activities are able to proceed at the same pace, and delays are almost inevitable. The sponsoring agency needs to identify all stakeholders, make sure all are aware of a realistic timescale, and make sure they are kept as fully informed as possible. This should be done without revealing confidential information about negotiations or being negative about the actions of any one group. The Downeaster development had some rough patches arising from unrealistic expectations of how quickly the service could be implemented and because various stakeholders felt they were not being properly informed of progress or left out.

NNEPRA benefits from having considerable independence from State government agencies, with more responsibilities and control over the details of the service than is usual for agencies that oversee state-sponsored intercity passenger rail services.

NNEPRA puts great emphasis on maintaining close contacts with all stakeholders, holding regular meetings, and being respectful of the concerns and positions taken by the stakeholders. It feels that there is nearly always a mutually acceptable solution to a problem, and finding and implementing that solution builds trust all round. Making critical remarks about a stakeholder is unacceptable. Maintaining good relationships with state agencies and legislators are especially important. The combination of solid financial performance and regular contacts builds trust and allows NNEPRA to maintain its independence.

With a very small staff of six people, NNEPRA cannot get involved in a lot of detail. It devotes part of its resources to basic performance tracking (ridership, revenue, on-time performance) and concentrates on a very small number of critical projects at one time. NNEPRA tries to avoid micromanaging its projects and is prepared to share project risk with its partners (especially the host railroad).

NNEPRA takes a pragmatic view of factors it cannot change or influence. For example, it would like New Hampshire to contribute to operating costs, and many would agree that it is unfair for Maine to bear the whole cost of a service given the number of New Hampshire passengers. But practically, NNEPRA knows it has no formal standing in New Hampshire, and in-state officials and interest groups in that state have to make the decisions themselves. Another example is the RRIF loan process, which can be tedious and bureaucratic, requiring a lot of apparently irrelevant information. However, instead of arguing, NNEPRA's attitude is just give them what they want and quickly, as the most effective way of getting rapid approval. In the event, the RRIF application was unsuccessful, and NNEPRA is pursuing funds through PRIIA or ARRA programs.

The limitations of the Downeaster example are that it is a very simple service serving a compact geographical area, and there is little need for complex capacity or cost modeling or service quality monitoring. Analysis and recordkeeping do not require much more than conventional spreadsheet methods. The structure of New England government is that many functions are the responsibility of individual towns and cities, which means that the Downeaster needs strong

relationships with those entities. In other states with different governance structures, county, state and MPO authorities may play a larger role.

D.6 A Synthesis of Approaches to the Negotiation Process Introduction

Initiatives to develop new passenger rail service can be complex, given the mix of interests between transit agencies, other levels of government, and private rail corridor owners. Building a true long-term partnership between public and private interests is essential to address the changes that inevitably impact joint use of a rail corridor; goals of each side must include the ability to work through challenges in this dynamic environment, instead of simply "reaching an agreement" that permits the first stage of service to begin.

This case study is a synthesis of information about the negotiation process learned during interviews with passenger rail agencies and other stakeholders. The information from these interviews formed the foundation for Sections 2 and 4 in the Guidebook. However, the reader should note that the interviews and this synthesis were prepared before the passage of PRIIA, thus some statements may be out of date. However, almost all the content is considered to be useful and relevant to post-PRIIA conditions.

As noted elsewhere in this report, the rights of access and negotiating leverage associated with "intercity" passenger rail are significant. Commuter rail proponents, by contrast, must depend solely on the willingness of a corridor owner to provide access. There is no direct recourse if, in the final analysis, the freight railroad elects to refuse new operations on their property. The discussion here relates to commuter rail startups. An intercity startup is more fully described in the description of multi-state corridor development in Section D.5. It might be noted that the designation of the NNEPRA's service as "intercity" was essential to getting the train operations in place. Under today's legal framework a commuter operation, using these same tracks, would likely have been impossible given the original stance of the freight operator.

Most freight railroads want to be advised from the earliest point of interest that a corridor is under consideration for joint use. These initial contacts are often through the railway's public or government affairs offices. After an initial meeting, these railway officials may or may not elect to engage other officers from within the carrier organization, depending upon the seriousness attached to the public agency request. If the commuter service inquiry appears to be highly speculative or lacks any specific funding source, the carrier may elect to wait for a second, more serious stage of investigation to begin. From the outset it should be noted that freight carriers view engagement in these discussions as a public interest or franchise protection activity—and they may be reluctant to commit serious resources until such time as a real prospect of passenger service is apparent.

D.6.1 Setting the Stage

Passenger service proponents and freight carriers often enter discussions about joint use with sets of priorities that work against each other:

- Passenger rail agencies may be anxious to demonstrate the viability of the rail mode and to initiate a minimum "core" service offering at least cost to build support and political momentum. Developing a "long-term vision" with at least scoping-level costs may be viewed as premature and time-consuming. Long-term cost estimates may be used by service opponents as evidence that an agency is opening the door to a financially ruinous set of infrastructure investments.

- Freight carriers recognize the political appeal of passenger operations and are reluctant to entertain "startup" operations without a robust funding regime and vision of long-term needs on both sides. They recognize the limits of political promises and the risks attendant to the election cycle.

As a confidence-building phase, both parties should acknowledge the other side's needs for a successful partnership:

- Passenger interests must understand the need for both passenger and freight service providers to have adequate capacity to serve their markets. Service to each is of equal importance.
- Freight carriers must acknowledge the goals of passenger interests, but do not wish the success of passenger operations to come at the expense of the freight franchise.
- All parties wish to create the safest possible operating environment.
- Costs for service and infrastructure should be shared "fairly" between the parties.

An ideal management environment for shared use is grounded in a partnership vision that moves well beyond the "vendor/purchaser" structure of older commuter rail agreements. Rigid, one-dimensional "purchase of service" agreements are poorly suited to shared-asset environments where the needs of both passenger authorities and freight interests are likely to change significantly over time. Passenger rail and DOT representatives from North Carolina, Washington State, and California in particular have noted the evolution of their relations with host freight railroads as a consequence of maturing relationships, higher levels of trust, and deepening of technical expertise on both sides of the table. Hallmarks of this evolution include:

- Sharing capacity modeling, work including transparency of model inputs and outputs.
- Creation and staffing by the public agency of positions that draw from railway engineering and operations experience. In some cases agency staff comes directly from the ranks of the host carrier.
- Development of a planning and management framework that permits more of the corridor-related work to be accomplished on a streamlined "task order" basis rather than as the object of new, formal negotiations.

All of this, of course, takes time—months, years, or even decades. A clearly defined business structure, at the outset, will help launch the shared-use voyage in positive direction.

D.6.2 Define the Business Structure

A public agency dealing with passenger rail issues for the first time is likely to find itself overmatched when first entering discussions with a freight corridor owner. Creating a better balance may require that the agency bring in some external resources to help with the negotiations—a consulting firm, personnel from a sister agency, or officials from another government department that has experience in dealing with freight carriers. Officials from the large railways have dealt with requests for shared use in numerous and varied circumstances and are likely to present the agency with a specific list of conditions that is precedent, from the carrier's perspective, of serious negotiations taking place.

The devil, they say, is in the details. One strategy to keep negotiations on track is to technically define, as clearly as possible, the tools and outcomes needed for a shared-use arrangement to move forward. Examples include:

- What is "capacity" and how is it measured? Is it a measure of daily throughput, ability to meet peak demand, or fluidity of operations during commute periods, and within what tolerances for on-time performance?
- How will changes in the physical plant and train operations be projected? What modeling tools are appropriate? What role do each of the parties play in confirming and reviewing the model inputs and outputs?

- How are forecasts for future demand (both passenger and freight) developed?
- What is the baseline physical condition of the property in question? How will improvements to the plant (unrelated to capacity) be funded and/or credited?
- What technical standards will apply to capital improvements?
- What mechanisms are appropriate for allocating ongoing capital and maintenance expense?
- What role will the freight carrier play in and around proposed station locations?
- What is the appropriate term of the shared use arrangement? Does the passenger agency require a permanent right to the alignment? Will shared use include consideration of shared title to property or a permanent easement?
- What level of future demand must be protected in the initial capital investment?
- How will service performance be measured and reported? What role will this data play in guiding future capital allocations?
- What are the limits of shared use? Are there specific break-points with regard to speed or service frequency that make clear the need for separate, dedicated trackage?

Other, corridor-specific technical issues will likewise need to be addressed. Given the variety of conditions that apply to shared corridor development responses to the questions above, specific examples will not be provided in this report. The relative weight and importance of the various elements will differ from place to place.

What *is* important, however, is that the definitions be fleshed out in advance of a specific corridor analysis. Development of and access to these definitions should be kept as transparent as possible. Public agencies will have a solid rationale for their decisions and freight carrier interests will have a strong footing from which they can defend their legitimate commercial interests.

D.6.3 What Other Elements Can Be Leveraged?

Public agencies and freight carriers alike should consider other, tangential areas of mutual gain that, while not essential to the corridor itself, may strengthen the underlying partnership. Observers in Washington State have noted that corridor improvements for the Seattle–Portland Cascades service have occurred within a broader public rail context that includes support for BNSF Railway Company's (BNSF) freight service enhancements. These have included improved access to and from the Puget Sound ports and re-opening of BNSF's Stampede Pass route over the Cascades. Other elements of mutual interest may include: long-term strategies to address major rail bottlenecks such as tunnels or bridges; grade separation or elimination as a safety or quiet zone strategy; and public support for addressing environmental mitigation and regulatory requirements associated with freight rail improvements elsewhere in the state.

State officials have become ever more aware that the rail mode can be leveraged to offset a portion of future intercity freight growth on the nation's highways; specific initiatives to encourage truck to rail or intermodal handling may, at times, be coupled to plans for passenger rail capacity enhancements.

Opportunities to link such issues often lie beyond the immediate purview of a local sponsoring agency for passenger rail service. State DOTs, as partners in the development effort, may play an important facilitating role in such circumstances.

Passenger rail agencies and several DOTs noted the importance of senior-level public sector officials and relationships with key railway executives in keeping a negotiations process in motion. Public officials charged with developing a specific corridor for passenger service may simply not be in a position to offer or discuss the trade-offs available to those who exercise influence at state or federal levels. Developing such relationships and communications channels is best done well in advance of a specific project—food for thought to those who foresee a significant public rail agenda as part of their mobility strategy.

D.6.4 A Vision of the Future

Development of a long-term vision for shared use should be an important goal of corridor stakeholders to build confidence, to streamline improvement negotiations, and to alleviate concern from either side that their needs will be held hostage to physical or institutional restraints at some future point. While fleshing out such a vision would ideally take place before the first trains ever run, the uncertainty of public acceptance of a new passenger service and the time and energy involved in creating the long-term plan means that this work must often be completed as a second phase. Some agencies never create such a vision at all.

A commitment to the time, staffing, and resources required for long-term planning should be made early in the discussions between the agencies and the corridor owners. The freight railroads must live within the constraints of a service network that, in most circumstances, will never move to new routes or alignments; this explains much of the conservatism such entities exhibit in protecting their priorities over the use of those assets. Time and energy invested in creating a robust and transparent framework for future operations and investment (by all parties) is time well spent.

D.7 A Synthesis of Approaches to Fees and Incentives

D.7.1 Background

Negotiation of fees for the shared use of any facility are often difficult, time-consuming, and a test of business relationships. This is true even of purely private negotiations between profit-seeking entities; it is even more difficult when a public agency and private firm are so engaged. Motivations of the two sides are very different, particularly in startup scenarios where a passenger agency is seeking to demonstrate the benefits of rail service at minimum cost. Freight rail corridor owners are meanwhile trying to protect the value of their franchise and to ensure that, at minimum, the passenger operator does not burden the economics of the overall rail operation over the line in question.

This section will describe the principal elements of a service fee arrangement for use of freight carrier-owned trackage by a passenger rail service provider. While other scenarios for shared use exist, such as between two passenger service agencies or, more rarely, for freight use of a publicly owned facility, the targeted scenario presents the situation for most future new start or expansion of passenger service operations.

As with discussion in Section D.6 on the negotiation process, this discussion was prepared before the passage of PRIIA, and may be similarly out of date in some respects. However, almost all the content is considered to be useful and relevant in post-PRIIA conditions.

D.7.2 Two Scenarios

At the outset it should be recognized that the negotiations scenarios and resulting fee arrangements differ markedly between intercity passenger offerings and commuter rail operations. Amtrak's right to operate using freight carrier trackage is described in detail in Section B.2.1 of Appendix B, and serves as a point of departure for discussions with a freight carrier and Amtrak relating to shared use. Commuter operations, on the other hand, enjoy no special legal status and may effectively be refused outright by a rail corridor owner. In this latter scenario the freight railway can be expected to take a more aggressive approach on compensation because the logic of moving forward, from their perspective, hinges on a contribution to the freight operator's bottom line.

The distinction between and commuter and intercity operations may at times appear to be quite arbitrary—services operating under Amtrak's rights include Downeaster trains between

Boston, Massachusetts and Portland, Maine as well as California's Capitol Corridor Oakland – Sacramento operations. Each would appear, to a casual observer, to share more characteristics with a classic commuter operation than with long-distance Amtrak trains. Given the emphasis on medium-distance "corridor" passenger train investments by most states, it would appear that the number of services that operate in this "gray zone" will only grow in years to come.

D.7.3 Freight Railroads Are in the Business of . . . Moving Freight

No principle is more important in the design and management of a shared use corridor than the parties' mutual understanding that each has a right to exist and to protect their stakeholder interests. For passenger rail authorities it is the understanding that protecting the ability of a freight operator to serve their freight clients is and always will be the first criterion in judging the merit of any service or compensation scheme.

On a given day the marginal contribution of fees from the movement of a passenger train will **never** compete with the revenue from use of that same capacity to move a freight train, no matter how high the fees charged to the passenger operator. Therefore, the burden of capacity investment to protect the integrity of a passenger operation always falls to the sponsoring passenger rail agency while ensuring that, at minimum, no harm is done the freight road's ability to serve its customers.

The need for a passenger rail agency to provide service capacity is very similar for commuter and intercity service proposals. Amtrak's statutory "right of access" is qualified to not "unduly burden" freight service. When freight volumes were declining and capacity was easy to find, the marginal burden to initiate passenger service was low. When main freight corridors are operating close to capacity, the burden of additional train frequencies can be severe.

In main line service territory the requirement for up-front capital to improve capacity and service reliability may be substantial, easily totaling $2–3 million per mile. Much smaller investments are required where freight service is more modest. Some metro areas, such as Nashville, have discovered the value of first exploring service on short line freight operators for this very reason.

D.7.4 Performance Incentives—Pathway to Perfection?

Stakeholders on both sides of the shared use issue are consistent in emphasizing the need to first recognize and address the operational capabilities of a given physical alignment as an essential foundation for high-integrity service. With such a foundation in place, a fee structure to reward performance does appear to support high levels of service reliability. Another way to view this is to recognize that once a good physical plant is in place the dispatch and operations discipline needed, at the margin, to earn the additional fees is well worth the compensation received. The flip side is that if valuable freight is delayed due to an inadequate plant, the performance incentives for passenger operations are not a sufficient offset for jeopardizing priority freight traffic. It is essential to deal with capacity constraints before high quality passenger service can be initiated BUT the capacity investment must be accompanied by a firm commitment from the railroad to provide an agreed level of service—number of round trips, journey time and limits on aggregate delays.

D.7.5 Cost Escalation

Several passenger authorities have noted the importance of carefully considering, in advance, the issue of cost escalation in long-term shared use agreements. The Association of American Railroads publishes a variety of Railroad Cost Adjustment Factors (RCAF) on a quarterly basis;

these benchmarks offer a superior calibration of needed contract adjustments than more broadly recognized measures such as the Consumer Price Index. If selecting an RCAF for agreement modifications, it is important to consider the specific circumstances in play; one index includes fuel costs, another does not. Similarly there are "productivity adjustments" incorporated in some of the indices that may or may not be relevant to the operations of a given rail corridor.

D.7.6 Intercity Passenger Rail

As of March 2009, there were no serious efforts in play to replace Amtrak's role in providing intercity passenger services. Some states, members of Congress, and corridor advocacy groups have recognized the potential value in considering competitive bids for services, but the simple truth is that Amtrak's unique statutory access rights, liability caps, and experience in dealing with the major freight carriers give Amtrak leverage in delivering new services that cannot be matched by alternative providers. Even states with relatively mature and far-reaching state supported rail programs defer to Amtrak for negotiation with freight carriers of operating rights and fees for intercity trains. Until and unless a replacement structure is legislated, Amtrak will continue to play its present role in development and management of intercity services.

Most interest in new services centers on routes in the 200–400 mile range. Amtrak will charge the sponsoring state or states the direct costs not covered by revenues for new services. Amtrak charges vary widely, depending on corridor length, patronage, fares, and the specific services provided by Amtrak, but passenger rail agencies report that typical charges often work out to between $1 million and $1.5 million per one way train trip (annually) in total charges payable by the state. States may be required to provide rolling stock for new service, as Amtrak itself has very limited surplus equipment even after rebuilds funded by ARRA, and is facing a replacement challenge internally due to the 26-year average age of its fleet.

Enlisting the cooperation of the host freight railroad may require a public capacity investment that delivers mobility gains to the freight operation as well as the new passenger services. Some carriers define this investment explicitly as protecting the **current** level of freight service **during the hours of passenger operation.** That additional capacity, available to the freight carrier during the overnight periods is their effective incentive for collaborating on an intercity proposal.

Other agencies underwrite capital and maintenance work in a given corridor to keep an alignment at a higher standard than would otherwise be the case for freight-only operations. Slow orders are reduced and, in some cases, the cycle of track work is "leveled" to a steady-state, year-by-year approach that minimizes track work disruptions during hours of passenger operations. While public support for these activities is not really a "fee payment" in a traditional sense, it does represent a set of ongoing incentives that substitute, to some degree, for relatively low payments by Amtrak to the host carrier.

Amtrak does provide system-wide incentives to host freight carriers for on-time performance of trains operating over each freight network. If a large system routinely delivers performance below the incentive thresholds, the efforts to provide performance incentives by an individual corridor sponsor may be frustrated. The Capitol Corridor Joint Powers Authority, faced with this dilemma, was able to negotiate specific incentive targets for its northern California operations:

- If trains are 92 percent on time, UP earns 50 percent of its maximum incentive the first month and 75 percent for each consecutive month thereafter.
- If trains are 96 percent on time, UP earns 75 percent of its maximum incentive and 100 percent for each consecutive month thereafter.
- When service falls below target levels, the incentive clock "re-sets" for incentive payments to again be in play.

D.7.7 Commuter Operations

As for intercity passenger proposals, the "price of entry" for even beginning a serious conversation with freight carriers for shared use is a definition of proposed service. The proposed service may then be incorporated in capacity assessment that defines, in turn, the required initial public investment needed for the freight railroad to protect their existing freight clients. Public funding of new capacity above this level may also be considered or put forward by the corridor owner; the ultimate resolution of needed improvements is a product of the negotiating leverage and partnering strategy for the corridor in question.

Once an agreement for funding of needed capacity is achieved, the passenger rail agency will face three additional cost elements related to use of the corridor:

- **An access fee for a specified number of train slots, payable on a variable, annual, or capitalized basis.** Some recent agreements include a "perpetual easement" for a specified volume of trains. This latter approach may be attractive from a political perspective in that public funds are used on a one-time basis to secure an asset, but without the legal complexity attached to joint title or division of real property. Many agencies also prefer to capitalize a higher proportion of total project obligations as an easier political sell than higher levels of ongoing financial support.
- **An operations fee payable on a variable basis to the host carrier, generally on a train run or train mile basis.** Depending on the structure of the service, this fee may include most operations expenses associated with the service (if the host carrier is operating the trains) such as crewing, equipment maintenance, fuel, etc. In nearly all circumstances the fee is intended to cover the basic "management" of a given train operation such as signal maintenance, communications, and dispatching.

  The range of operating fees for commuter operations varies widely, even for similar coverage of cost elements. One explanation for this wide variation is the differing approach to capital investment from one corridor to another. A freight railroad may, for example, be willing to forgo higher operating fee revenue in exchange for a substantial public injection of new infrastructure capital that solves a freight operations bottleneck.
- **An infrastructure maintenance fee or allocation.** In some cases this factor is estimated by the host carrier and quoted to the passenger service provider in advance. In other circumstances actual capital and maintenance expenditures are apportioned to corridor users on a gross-ton-mile basis. This fee is intended to cover all ongoing maintenance and may or may not include an accrual for long-term capital renewals. In all cases it is desirable that engineering records be shared and kept transparent to engender a level of trust among the stakeholder groups as they share risks and opportunities for future use of the corridor assets.

While these steps have been described sequentially, assessing the viability of an entire service package requires simultaneous and somewhat iterative treatment of all these cost factors. Service frequency drives ridership and the required up-front capital investment as well as the ongoing fees for operation of the service. Each scenario will likely need to be fleshed out to provide at least a scoping-level estimate of required capital and operating support. Finally, the inclusion of federal funds as part of a commuter new-start package requires substantial up-front agreement with the host freight carrier for release of FTA planning monies at various stages of the project.

Abbreviations and acronyms used without definitions in TRB publications:

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	Air Transport Association
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
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