

**Passenger Rail and Freight Rail Partnerships: Case Studies in Boston,
Chicago, and Denver**

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ABSTRACT

With population and traffic congestion growing in urban areas throughout the United States, the demand for passenger rail service is also growing. The opportunity exists to minimize environmental and social impacts of expanding rail transit by sharing existing corridors with freight rail operators. The purpose of this study is to evaluate existing agreements between freight and passenger rail services and identify issues, challenges, and best practices of shared-use corridors. This research includes an analysis of the existing literature, in-depth interviews with national experts, and in-depth interviews with local area experts in three case study cities with substantial experience in shared-use rail corridors: Boston, Chicago, and Denver.

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INTRODUCTION

In the U.S., the demand for increased commuter and intercity passenger rail service is increasing due to population growth and traffic congestion. Amtrak service is growing and high-speed rail service is planned in a few major corridors. Locally, transit agencies are looking to expand their light rail and heavy rail service to meet the transportation needs of their region. Because the railroad networks are already built out through densely populated cities, most experts agree that sharing freight rail corridors is one of the least environmentally and socially impactful ways to expand passenger rail services across the country. As plans for shared-use railroad corridors increase, more research is needed to improve, encourage, and sustain the cooperation between freight and passenger rail.

This research examines the use of public-private rail partnerships across the country by identifying and describing existing relationships between freight and passenger rail, analyzing elements of good agreements and bad agreements, and developing best practices in corridor sharing. Commuter rail and Amtrak operations in three case study cities, Boston, Chicago, and Denver, are also examined in detail. Amtrak, regional authorities, and/or transit agencies in each of the three cities have had experience in conducting negotiations with freight railroads concerning the acquisition or use of rail corridors, rights-of-way, or tracks. It is important for public transportation agencies and authorities at all levels—federal, regional, state, and local—as well as the private railroads to learn from these cases and to develop more effective partnerships. A literature review of public-private partnerships between freight rail and passenger rail operators across the US and in-depth interviews with key participants and stakeholders at the national and local levels yield useful examples of both positive and negative experiences, and best practices in freight and passenger rail partnerships.

OBJECTIVE

This research intends to identify, describe, and analyze existing relationships between freight railroads and passenger rail operators for the purpose of facilitating future public-private partnerships in rail corridor capacity expansion and gaining a better understanding of this major intermodal transportation issue. Building upon the research conducted by Bing et al (2010) in a National Cooperative Highway Research Program (NCHRP) report, this research will:

1. Identify and describe existing literature on public-private rail partnerships across the US, including Amtrak, state and local governments, regional authorities, local transit agencies and private railroads, and review existing literature on shared-use rail corridors.
2. Conduct interviews with national freight and passenger rail experts and review existing literature to better understand the current state of passenger rail/ freight rail partnerships in the U.S. in order to encourage best policies and practices in the future.
3. Conduct three case studies that analyze the current status of rail corridors in Boston, Chicago, and Denver looking specifically for how commuter rail, and rail transit systems in general, have acquired and/or share the use of rail corridors in partnership with the freight railroads.
4. Use the case studies to gain insights into the nature of the relationships between the public agencies and the private railroads and the impact of these relationships on the economic competitiveness of each of their intermodal transportation systems.

SCOPE

This research is intended to identify the current and future locations of shared-use corridors (especially in Boston, Chicago, and Denver), which private companies and public agencies are involved in these agreements, and general best practices and policies in developing shared-use agreements. This research also addresses positive and negative experiences of corridor sharing and its impacts on economic competitiveness.

This report focuses on 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, which refers to the interconnected network of railroads in the United States, and excludes lines such as urban rail transit lines or private rail lines that have no direct connection to the national rail network (Bing et al 2010, 5-6). It does not address locations where multiple freight railroad companies share corridors or tracks.

METHODOLOGY

The research utilized multiple methods to accomplish the principal objectives of the study. First, literature on public-private partnerships between freight rail and passenger rail operators across the US was collected and analyzed. The literature review included public and private reports as well as scholarly articles. The 2010 TRB *Guidebook for Implementing Passenger Rail Service on Shared Passenger and Freight Corridors* (Bing et al 2010) provided an excellent background into the many issues related to public-private rail partnerships. It has appendices on applicable acts of congress and federal government regulations, capacity and cost analyses, legal and institutional arrangements, safety regulations, and an appendix with several limited case study descriptions of passenger rail development on freight lines.

Second, interviews with general experts on freight and passenger rail issues were conducted. The national experts were identified through personal knowledge and snowball sampling. The annual TRB conference and rail group committees also served as outstanding sources for finding rail experts. Interviewees included representatives from Amtrak, FRA, AAR, freight railroads, and passenger services.

Third, in-depth case studies of public-private rail partnerships in the Boston, Chicago, and Denver metropolitan areas were developed. Key decision-makers and policy officials for both the freight railroads and the public agencies that operate rail transportation services in each of the three case study cities were identified through personal knowledge and snowball sampling. Face-to-face, in-depth interviews were conducted with these key participants and stakeholders in order to elicit their perspectives and viewpoints concerning the nature of these public-private rail partnerships. Interviewees included representatives from transit agencies, state DOTs, passenger rail advocates, freight rail representatives, consultants, and local officials who had experience concerning the acquisition or use of rail corridors, rights-of-way, or tracks. The general expert interviews and case study interviews were audio recorded, transcribed, and coded to reveal common themes from the interview questions.

The Boston, Chicago and Denver metropolitan regions were chosen to be the three case study areas. The Boston metropolitan region was chosen due to its long history with the railroads and rail transit, its extensive commuter rail system and its geographical location as a major node in the Amtrak Northeast Corridor. Partnerships between freight and passenger service have been an issue for many years.

The Chicago metropolitan region is home to some of the most intensive freight and passenger rail activity in the country. Nine of eleven Metra commuter lines operate on tracks owned or

controlled by seven of the nation's eight Class 1 railroads, and four regional Amtrak lines with more than fifteen daily trains also share these same tracks. The major private and public rail stakeholders in the Chicago region are partners in the CREATE (Chicago Region Environmental And Transportation Efficiency) program intended to expand rail capacity, streamline operations, and relieve traffic bottlenecks. The CREATE program is an example of a successful public-private rail partnership that recognizes the challenges of accommodating both freight and passenger rail needs in a highly-congested environment.

The Denver metropolitan region was been chosen due to its long and significant history of railroads, and its current effort to build a regional rail transit system through its 2004 FasTracks transit and land use plan. Of the six new rail lines proposed in the FasTracks plan, five are scheduled be built at least partly within freight rail corridors. While access to the rail corridors has been acquired on four of these lines, negotiations over the proposed Northwest Corridor line have stalled, thus placing that line's completion in serious jeopardy. It was especially important to analyze the major impediments to a public-private rail partnership in this case.

DISCUSSION OF RESULTS

Literature Review

System Trends

US passenger rail and rail transit have been experiencing a renaissance in recent years. Ridership on Amtrak, especially in major metropolitan corridors has experienced steady growth over the past 15 years and new high-speed passenger rail plans are moving forward in California, Illinois, and the Northeast Corridor, among other regions (Perl and Goetz 2013).

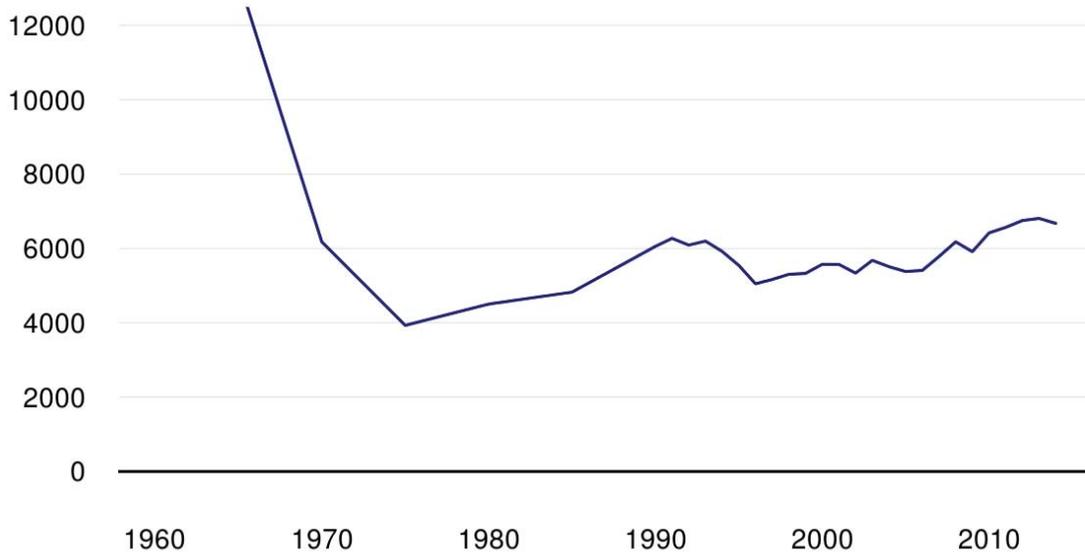


Figure 1: US Annual Amtrak / Intercity Rail Passenger-Miles (Millions)
(Source: Bureau of Transportation Statistics US DOT, 2016)

Likewise, rail transit systems in metropolitan areas have been expanding, and the number of passenger miles traveled on commuter rail systems has grown over the past four decades at an average annual rate of 2.5%, while automobile passenger miles have only grown at an annual rate of 1% and may be leveling off (BTS 2016; Puentes and Tomer 2009).

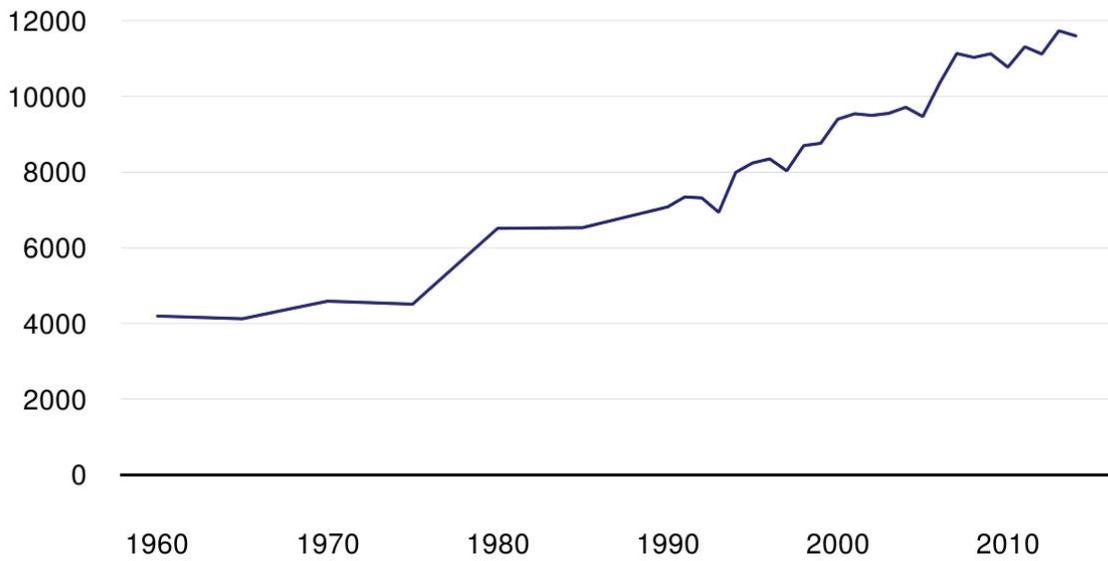


Figure 2: US Annual Commuter Rail Passenger-Miles (Millions)
 (Source: Bureau of Transportation Statistics US DOT, 2016)

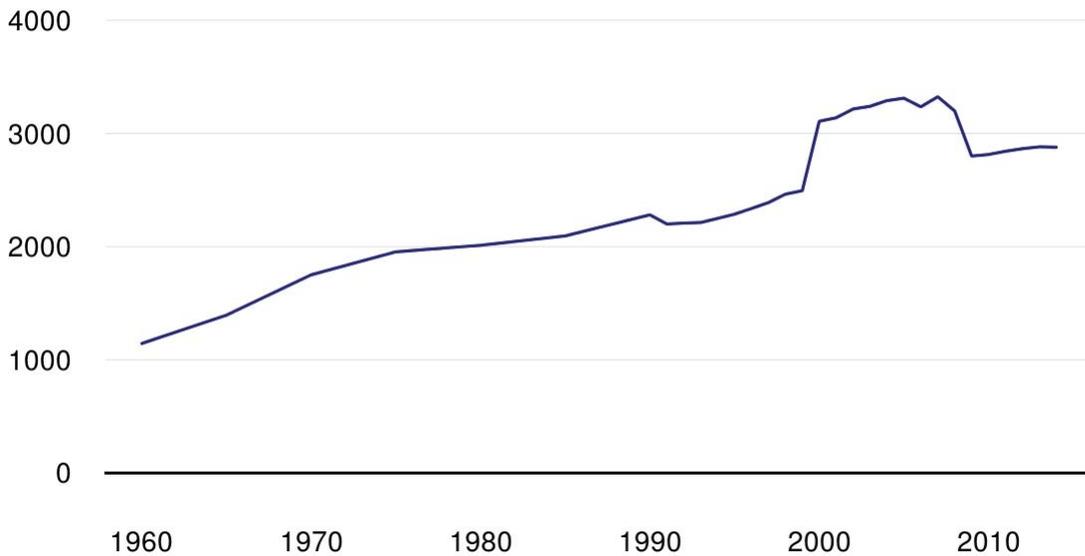


Figure 3: US Annual Automobile Passenger-Miles (Billions)
 (Source: Bureau of Transportation Statistics US DOT, 2016)

In 2013 there were 33 agencies operating light-rail systems and 15 agencies operating heavy rail systems across the United States (APTA 2015a, 42-43). Reconnecting America (2011) identified a total of 643 potential new fixed-guideway projects in 106 metropolitan regions.

With this interest in rail system expansion, there is an increasing focus on intermodal partnerships between freight rail companies and passenger rail operators concerning the use of railroad corridors. Since freight rail companies own most of the existing rail corridors, many current and proposed passenger rail systems must rely on acquisition or shared use of freight railroad corridors, rights-of-way, and/or tracks to provide passenger service.

But at the same time that passenger rail operations have expanded, so too has freight rail traffic. From 1990 to 2014 rail freight revenue ton-miles grew at an average annual rate of 2.3% (BTS 2016). The US Department of Transportation predicts an annual average rail freight tonnage growth rate of 0.7% over the thirty years between 2015 and 2045 (BTS 2016b). Accompanying this growth has been a rationalization of the Class I rail network and intensification of use. This has resulted in the movement of record amounts of freight on the smallest amount of total national route mileage since the 19th century (BTS 2016; Carter et al 2006).

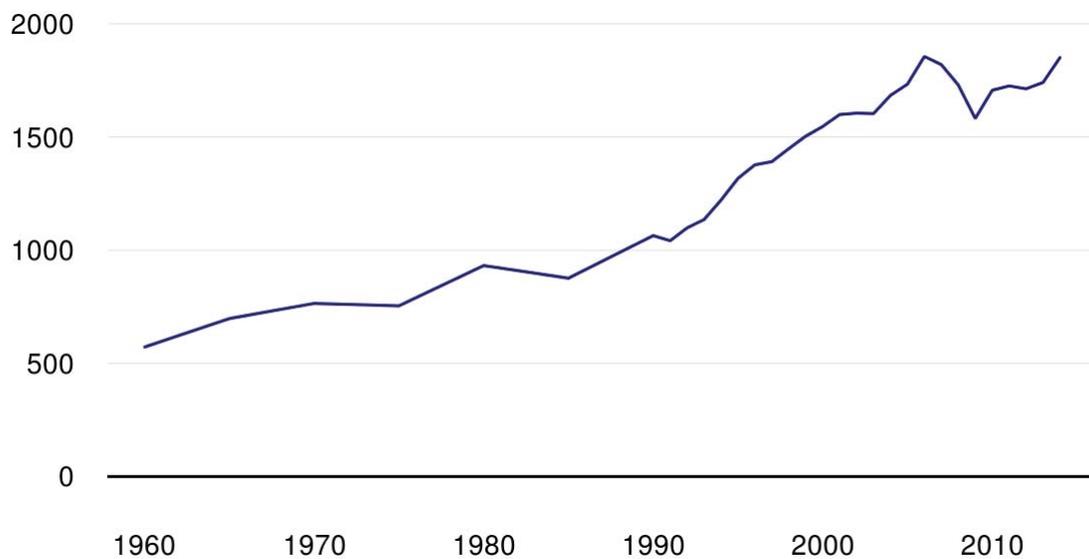


Figure 4: US Annual Class I Rail Freight Revenue Ton-Miles (Billions)
(Source: Bureau of Transportation Statistics US DOT, 2016)

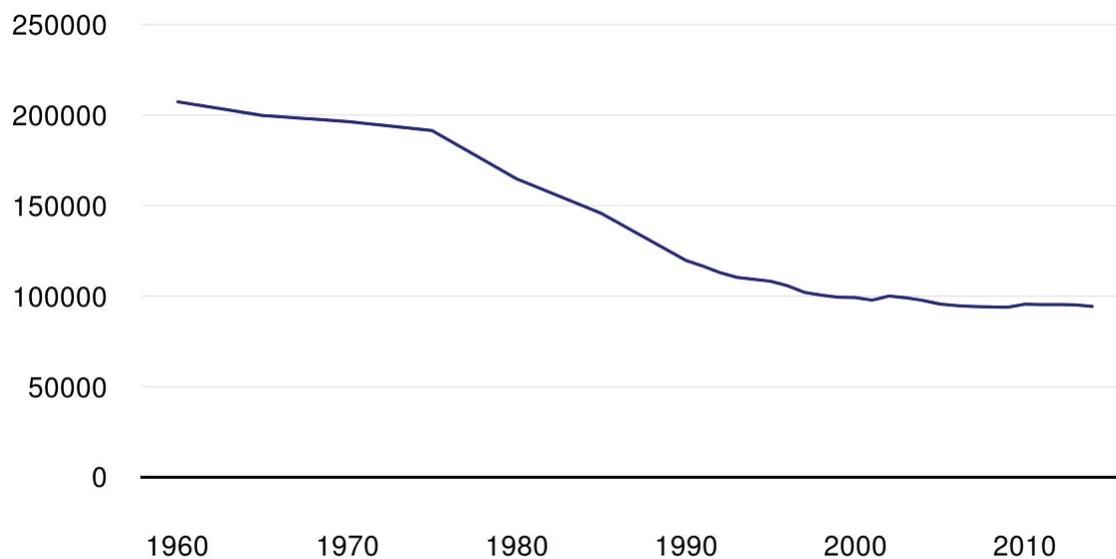


Figure 5: Total Class I Rail Route Miles
 (Source: Bureau of Transportation Statistics US DOT, 2016)

Thus, freight rail companies are equally concerned about maintaining and expanding capacity for current and future freight rail traffic. The growth of both freight and passenger rail operations has resulted in greater demand for the use of these rail corridors, and the need for additional research on the agreements that specify how these corridors are to be used and ways to maximize their productivity for the entire intermodal transportation system.

Types of Sharing Agreements

This report focuses on 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, which refers to the interconnected network of railroads in the United States. It excludes lines such as urban rail transit lines or private rail lines that have no direct connection to the national rail network (Bing et al 2010, 5-6).

The US Federal Railroad Administration defines three types of shared-use railroad corridors (Resor 2003):

- **Shared Track:** Heavy or light rail vehicles operate on the same tracks used by freight trains. FRA has written regulations governing this type of operation, in which temporal separation (no simultaneous operation) is required in most cases
- **Shared Right-of-Way:** Transit vehicles run on separate tracks, but track centers are less than 25 feet (that is, separation between the centerline of the freight track and the

centerline of the passenger track is less than 25 feet). Tracks separated by less than 25 feet are defined as “adjacent” by FRA, and certain roadway worker protection rules apply on adjacent tracks. FRA also defines “less than 30 feet” as the distance at which tracks are "non-insular" and operators are therefore subject to certain railroad regulations

- Shared corridor: Transit and freight operators share a transportation corridor, but tracks are separated by at least 25 feet and no more than 200 feet. FRA believes that intrusion by derailed freight or transit cars onto a parallel railroad track is unlikely beyond 200 feet

There are four operating regimes within shared corridors (Booz Allen Hamilton et al 2009, 60):

- Strict Temporal Separation
- Shared-Corridor Spatial Separation
- Concurrent Single Track Operation
- Concurrent Multiple Track Operation

The owner of a corridor is normally known as the host railroad, and other rail services operating over that corridor are known as tenant railroads. Tenant railroads must negotiate access agreements with host railroads. Most railroad corridors in the US are privately owned, operated and maintained by freight companies, although some corridors are owned by Amtrak, state governments or local governments and operated primarily for passenger service (Bing et al 2010, 5).

Given the different types of ownership and use, there are six different types of host-tenant relationships (Bing et al 2010, 53):

- Amtrak Intercity
 - Freight Railroad Host, Amtrak Tenant
 - Amtrak-Owned ROW, Freight and Commuter Tenants
 - State-Owned ROW, Amtrak and Freight Tenants

- Commuter Rail
 - Freight Railroad Host, Passenger Tenant
 - State- or Local-Owned ROW, Commuter Host, Freight and/or Amtrak Tenants
 - Amtrak-Owned ROW–Amtrak Host, Commuter and Freight Tenants

Contracts set access fees based on one or more of the following cost allocation methods, the first three of which are most common (AECOM 2007, 7):

- Avoidable Cost (Incremental Cost): Tenant users are assigned only those costs that could have been directly avoided if the user were not served
- Attributable Cost (Fully-Allocated Cost): Avoidable costs plus a proportion of common costs
- Variable Cost: Proportion of total cost of services based on train-miles, ton-miles, passenger-miles, etc.
- Fixed Allocation (Set Fee)
- Zero Allocation: No charge for certain costs
- Surcharge Rates: Applied to labor, fuel, materials, etc.

The quality of the host-tenant relationship can be ranked in four levels (Vilter 2006):

- Unconstrained: There is little competing traffic, and good on-time performance (OTP) is relatively easy to achieve
- Performing: There is significant traffic, but the host railroad management still produces good tenant OTP
- Nonperforming: There is significant traffic, and the host railroad impedes tenant OTP
- Severe or Breakdown: There is congestion so severe that the host railroad reliability is impaired along with tenant

Reports cataloging shared corridors and their characteristics include APTA (2015a), Brock and Souleyrette (2013), and Resor (2003).

Prior Reports

Economic, political and technical issues associated with the sharing of rail corridors have been the subject of a wide variety of studies over the past three decades since the post-Staggers revival of US freight rail.

Dornan (1983) performed a survey to facilitate comparative analysis of commuter rail system costs, including cost allocation methods used by the railroads for billing contracting agencies for commuter rail service. “The choice of cost allocation methodology is a major facet of the operating agreement negotiations. The outcome of these negotiations is highly dependent on the operating characteristics of the system and the strength of the bargaining positions of those involved in the negotiations.” While this study is over three decades old, the observations and strategies in this document remain relevant (AECOM, 2007, 9).

A more comprehensive study of shared-use practices was undertaken by the Institute of Transportation Engineers (ITE) Technical Committee 6A-28 that involved a national survey of the type of services shared, length of service and agencies involved (ITE 1985). Liu et al (2005) note that as a descriptive snapshot, this report did not capture information on the planning process or failed/rejected shared-use opportunities.

Eisele (1985) explored the technical aspects of the interface between passenger and freight operations, with a focus on infrastructure and scheduling. This report is notable for pointing out the potential that then-emerging computer modeling/simulation technology had for improving operations.

Phraner et al (1999) in a report for the Transit Cooperative Research Program explored issues with the joint operation of light rail transit or diesel multiple unit vehicles with railroads. While much of the focus was technical incompatibilities of infrastructure, operations and rolling stock, regulatory and liability issues were also discussed. Successful German and Japanese experiences with joint use were offered as possible templates for similar operations in the US, with a principal conclusion that “joint use has potential for implementation, in North America, but under limited and controlled circumstances.” And a secondary conclusion consistent with other shared-track studies was that “case-by-case local innovation, rather than general wisdom, applied uniformly to joint use.”

Travis (2000) used a case study of the then-planned upgrade of the Chicago-St. Louis Union Pacific corridor as a possible incremental path to high-speed rail (HSR) in the US. The

comparatively light level of freight operations on this route makes generalization from this situation difficult, but the structuring of this project as a private-public partnership, the use of modeling in the planning process, and the mutually-cooperative relationship between the railroad and the HSR agency were cited as probable keys to success. While this project was ultimately deferred for over a decade, the lessons may still be relevant.

Sheys and Spear (2000) utilized a telephone survey along with review of relevant Federal Register notices; and a review of relevant Federal Railroad Administration (FRA) rule-making activity and informal guidance to analyze regulatory and institutional issues associated with safety oversight of shared-track operations.

Nash (2003) in a report from the Mineta Transportation Institute focused on shared infrastructure in high-speed rail systems. The report consisted of a literature review and a series of interviews with a group that included technical experts from European railroads, European railroad research institutes, Amtrak, the U.S. Federal Railroad Administration, U.S. railroad planners, and other related parties. The stated objective of this research was “to identify infrastructure and operating strategies that improve the operation of shared-use HSR systems,” with an essential finding that strong partnerships were critical to success.

The FRA (2005) prepared a guidance manual for developing long-range (20-year) mixed freight / passenger corridor technical plans. This document had an engineering focus on route selection, physical characteristics, operations, and project management. A similar work by Sela, Resor and Hickey (2003) was based on a technical census of 30 commuter systems operating in shared environments with freight railroads and categorized common characteristics. This complimented a descriptive catalog of common use rail corridors by one of the authors (Resor 2003).

The 2006 Annual TRB meeting featured a session (summarized in AECOM, 2007) highlighting a number of critical economic and public policy issues related to shared corridors. Mitchell (2006) gave a freight railroad perspective on shared corridors in noting two fundamental principles held by BNSF: the railroad would not put its freight franchise at risk for passenger service (maintenance, speed, operations, future growth), and the railroad would not cross-subsidize passenger service with freight revenues (liability, reliability, equipment, infrastructure, etc.). Vilter (2006) responded from Amtrak’s perspective by outlining a continuum of host environments (unconstrained, performing, nonperforming, breakdown) and strategies for dealing with those different environments.

A trio of projects in the mid 2000s are directly analogous to the research presented in this document. The Center for Transportation Research at the University of Texas at Austin

undertook a research project for the Texas Department of Transportation examining issues associated with shared rail infrastructure and right-of-way (ROW) by passenger and freight trains (Prozzi, 2006; Dolata et al 2005). This research included interviews with transit agency and freight railroad personnel, an extensive literature review, and case studies from outside Texas. Findings were consistent with other studies in concerns over capacity constraints, liability, cost, and trust. Their research also echoed earlier and later research in noting that there is no single best shared-use agreement that can fit all situations.

A similar study was conducted by a team from the New Jersey Institute of Technology for the New Jersey Department of Transportation and centered around a nationwide survey of 21 commuter rail services in North America with the intent of gaining a general understanding of shared-use practices (Liu 2004; Liu et al 2005). Key factors were identified that contributed to or impeded successful shared-use operations between commuter rail and freight railroads by examining detailed operation arrangements, shared asset management, dispatching priorities, accident histories, and insurance and liability issues.

A third study from the U.S. Government Accountability Office (2004) was similarly interview-based, albeit with more of a focus on what role the Federal government should have (if any) in negotiations between commuter and freight railroads. They found that both commuter and freight rail officials saw compensation, capacity, and liability issues as presenting the most serious challenges when negotiating agreements. They also found that, “In general, most commuter rail agencies would like the federal government to play a more active role, such as serving as a mediator,” while “freight railroads do not want the federal government involved, except for assuring the adequacy of funding for commuter rail projects.” Their conclusions also echoed earlier and later research in noting that, “There is not a defined formula for developing mutually beneficial arrangements between commuter rail agencies and freight railroads.”

Ames and Walsh (2006) conducted surveys and interviews with a number of short line railroads, regional railroads, and transportation planners to sample attitudes, interest, and conditions related to potential joint development with non-Class-I operators. They concluded that there was potential for success with “new planning methodologies that meld rail transit and rail freight interests, project goals, and conceptual design standards in joint development programs.”

AECOM Consult (2007) in a report for the National Cooperative Highway Research Program analyzed the cost-allocation methods for commuter, intercity, and freight rail operations on shared-use rail systems and corridors, providing both a description of the different methods

as well as suggestions for negotiations. The theme of cooperation from similar reports was echoed in the finding that, “Access negotiations are likely to be most fruitful and result in an equitable cost-sharing agreement when each party recognizes the needs of the other.”

A report by Booz Allen Hamilton et al (2009) for the Transit Cooperative Research Program is one of a number of studies (including Phraner et al 1999, Phraner 2001, Bing et al 2006) that looked specifically at the shared use of railroad infrastructure using light-rail vehicles not meeting Federal Railroad Administration (FRA) crashworthiness regulations. While noting the significant (and site-specific) challenges to this approach, the report found that this “co-mingled” use of track has “enormous potential for public transit expansion because freight rail corridors that crisscross the nation often provide the only transportation corridors left to connect suburban development to many urban communities.”

Wilcock and Stoetzel (2009) explored the history and structure of contracted commuter rail services, which involve public agencies contracting with the private railroads to provide passenger service. These relationships take a variety of forms, with different aspects of single service often distributed across multiple public and private entities. The report echoes earlier and later research in noting that relationships have to be tailored to specific situations and there is no one-size-fits-all template.

Bing et al (2010) created an extensive guidebook for the Transportation Research Board (TRB) summarizing a vast amount of research on shared corridors and offering specific step-by-step guidelines on how to successfully negotiate and implement corridor sharing agreements.

The Ohio Statewide Rail Plan Final Report (ORDC 2010) included a Commuter Rail Checklist that listed 20 steps likely to be part of a successful planning process. The potential host freight railroad should be involved throughout the process, especially in helping to develop a conceptualized operating plan, involvement on the study steering committee, performing an operations simulation, calculating costs, helping to develop the transportation plan, and negotiating the operating agreements. The Federal Railroad Administration [FRA] (2005) has issued guidelines on railroad corridor transportation plans that must be followed in order to garner FRA support for any shared use project. A 2011 joint rail conference between ASME, ASCE, IEEE and AREMA titled “Shared Corridors, Shared Interests” produced a number of relevant papers. Guerrero et al (2011) conducted a number of case studies to understand the relationship between passenger and freight operations in the US and to identify areas of conflict and opportunities for improvement. They supported the use of hybrid agreements where government agencies fund capacity improvements for passenger

and freight operations simultaneously as offering the best approach for dealing with these conflicts and adapting the rail network to meet demands into the future. Keller (2011) focused on the benefits of PRIIA-mandated state rail plans in creating an inventory of the existing rail system, codifying state passenger rail service objectives, analyzing rail's transportation, economic, and environmental impacts in the State, and organizing a long-range investment program for current and future freight and passenger infrastructure in the State. Zarembski et al (2011) described shared issues and fundamental trade-offs that the parties must agree upon related to overall track design, track geometry, track curvature, super elevation options, allowed speeds in curves, more robust protection at grade crossings, and the manner in which these changes from the freight only corridors are to be allocated given the resulting much higher track maintenance costs of these to be shared assets. Iacobacci (2010) presented an overview of the relationships between the main stakeholders operating trains on North America's rail networks, and discussed the implications of associated congestion issues, including adverse environmental and social issues.

Research Areas

While the existing research is extensive and detailed, revision may be needed to reflect current economic conditions, the current legal / policy / liability environment, and contemporary projections for changes in commutation patterns. We hope to be able to update and augment accordingly.

We also hope to be able to take a longitudinal view of long-standing agreements to determine best practices for agreement maintenance in addition to best practices for agreement negotiation.

Much of the literature was developed by engineers and has a notably positivist and apolitical tone. This skirts fundamental normative, socio-political issues that are important to negotiations and the subsequent sharing relationships. While undertaking a deep sociological analysis of shared corridor relationships would be extremely challenging and is outside the scope of this study, we do hope to be able to fill in some of the social silences in the existing literature.

The discourses of congestion persist in discussions of passenger rail as they have at least since the 1960s (Minn 2012). More people on a finite amount of land means more congestion. Trains are an option to preserve mobility, at least for some people. The options will only get more expensive, and shared corridors are usually the only practical option in built-up areas. Therefore, guidance on how to make the sharing of corridors a more positive

experience for both freight and passenger operators can offer benefit to them and to the broader public.

General Analysis of National Issues in Shared Corridors

Introduction

This section discusses the major issue areas and best practices in shared use corridors from the literature as well as findings from interviews conducted with national freight and passenger rail experts. Several key issues emerge from a survey of the literature: capacity, liability, cost sharing, capital constraints, and the special conditions related to Amtrak involvement in shared corridors. Best practices include recognizing each situation is unique, and the importance of trust and bargaining, experienced negotiators, forward thinking, and clear, realistic goals and objectives.

Interviews with national freight and rail operation experts illuminated examples of the best and worst corridor sharing agreements and best practices for future agreements. Economic competitiveness, the use of government policy to support shared corridors, and the future of shared use agreements is also discussed.

Issue Areas

Capacity. The simultaneous increase of passenger and freight demands within limited corridors through often densely built-up areas results in fundamental spatio-temporal contention at the heart of all corridor sharing negotiations and disputes. This contention is exacerbated by fundamental differences between passenger and freight service. The associated capacity issues are the first of three primary sources of contention in shared agreement negotiations (GAO 2004, 2).

Passenger operators run high-speed service on precise schedules within fixed blocks of time (notably rush hours), with on-time performance measured in minutes. In contrast, freight services generally run lower-speed service in less-precise schedules on a 24-hour basis, with on-time performance measured in hours rather than minutes. The sharing of track between services with different speeds and different timing requirements reduces the overall capacity of the track and adds complexity to dispatching as slower-speed freight and higher-speed passenger service must be routed around each other (Iacobacci 2010, 7-8).

Freight trains are generally long, heavy and slow while passenger trains are comparatively short, light and fast. Passenger safety, comfort and reliability often necessitate expensive maintenance to higher track classes than are necessary for freight service on those same lines

(AECOM 2007, 14). These differences can also be reflected in track design parameters, such as superelevation, bridge clearances and horizontal clearances (Zarembski et al, 2011).

Iacobacci (2010, 12) notes a general agreement across both freight and passenger operators that dedicated corridors, or at least dedicated track, are preferable to shared track. However these dedicated lines can be quite expensive (especially in heavily built-up urban areas) and may not be justifiable on a cost-benefit basis, thus making shared corridors and/or track more viable options.

The engineering challenges of shared rail corridors are discussed further in Caughron, Saat and Barkan (2012), Sela, Resor and Hickey (2003), FRA (2005) Lopez-Pita and Robuste (2001), Phraner (2001), Phraner et al (1999), and Ullman and Bing (1994).

Liability. Another fundamental difference between passenger and freight operations is significant additional liability for passenger injury, death, or property damage in the event of an accident. Liability issues are the second of three primary sources of contention in shared agreement negotiations, and freight railroads endeavor to minimize their risk for anything related to passenger transit (GAO 2004, 2; Christner and Mauri, 2005, 8).

The Amtrak Reform and Accountability Act (ARAA) of 1997 (49 United States Code §28103) limits the aggregate allowable awards to all passengers against all defendants for all claims arising from a single accident or incident (including punitive damages) up to \$200 million. This includes all passenger operations, but does not include railroad employees or to injuries to third parties, residual liabilities, and other property losses arising from the accident (Bing et al 2010, 29).

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, so freight railroads often ask for liability insurance levels up to \$500 million for some commuter rail operations, which adds considerable cost to the operations (Bing et al 2010, 30). These concerns increased after the 2008 Chatsworth accident in the Los Angeles area when a Metrolink commuter rail train failed to heed a red signal and crashed into a Union Pacific freight train on the same track, resulting in 25 fatalities. While responsibility for this accident was clearly on the commuter rail operator, freight railroads were nevertheless concerned that victims' lawyers might target "deeper-pocket" private railroads for related damages, and that the \$200 million liability cap could be legally or legislatively challenged by catastrophic accidents such as Chatsworth. Following the accident, some Congressional legislators questioned the liability cap and suggested changing the cap

retroactively. This continues to cause concern for freight railroads entering into shared-use agreements with passenger operators.

The issue of liability is significantly mitigated when the passenger agency is the owner of the track. Reduction of exposure to risk of claims from passengers can be an incentive for freight railroads to sell assets to public entities (Christner and Mauri, 2005, 8).

Studies focusing on liability include United States Government Accountability Office (2009) and Christner and Mauri (2005).

Cost Sharing. The issue of passenger service compensation for infrastructure cost and opportunity cost is the third of three primary sources of contention in shared agreement negotiations, and can remain a persistent irritant to the relationship if not addressed to the satisfaction of all parties (GAO 2004, 2).

While an incremental cost approach has been integral to Amtrak intercity operations, that approach has also been a continual point of contention. An incremental cost approach may appear to be a less expensive option when available for commuter operations, but it can also result in inadequate corridor capacity and reliability, and, ultimately, a negative effect on the health and utility of passenger service (AECOM 2007, 3).

Railroad cost analysis is a specialized and arcane field, and the assistance of experienced staff and/or consultants is needed for success (Prozzi 2006, 3).

Cost sharing arrangements are discussed extensively in Dornan (1983), AECOM (2007), and Bing (2010, 45-51).

Capital Constraints. The US rail network consists of around 140,000 miles of track (AAR, 2016b). Total reported asset valuation for the seven Class I railroads at the end of 2015 was around \$268 billion (Company 10K filings). The freight railroads spent around \$30 billion (around 40% of revenue) in 2015 on capital expenditures and maintenance expenses related to locomotives, freight cars, tracks, bridges, tunnels and other infrastructure and equipment (AAR 2016a).

Capital has been a fundamental challenge for the railroads since their advent (Keefer 1850), and Perl (2002, 241) notes that investors are generally averse to sinking the massive amounts of capital needed for significant additions to track capacity, especially in the context of competition with publicly-subsidized air, water, and road infrastructure.

As private companies with a fiduciary obligation to their shareholders to maximize the value of existing assets, the freight railroads are unwilling to cross-subsidize passenger operations or place their own operations at risk for the larger public good (AECOM 2007, 2; Mitchell 2006). This response to the mixed public-private role of railways has not changed since Wellington (1908, 15) stated, “Railways are not undertaken unless they are expected to be profitable, not to the general public, nor to other parties in the near or distant future, nor to those who lend money on them, but to those who at first control the enterprise.” If the public wants rail capacity, then the public needs to pay for it.

Public-private partnerships have been one response to this issue, although the private railroads are wary of problematic requirements accompanying such funding, and those concerns have been a source of difficulty in negotiation (AECOM 2007, 2).

Amtrak Involvement Brings Special Conditions The Rail Passenger Service Act of 1970 that created Amtrak granted the national rail passenger service carrier statutory right of access to freight railroad-owned corridors for its nationwide system. Amtrak is required only to compensate the owning freight railroads for the incremental costs associated with accommodating Amtrak-operated passenger service (intercity or commuter) over their lines. Amtrak also maintains umbrella liability agreements with the freight railroads that do not need to be renegotiated for individual routes. In some cases, Amtrak can also supply existing rolling stock. These provisions give Amtrak a negotiating advantage that state and local passenger agencies do not have (AECOM 2007, 2; Bing et al 2010, 57).

Although Amtrak serves as a contract operator for commuter rail agencies, its intercity statutory rights only apply to routes over 100 miles in length that serve primarily intercity travelers rather than commuters. Amtrak’s incremental cost rights are also limited if the existing freight operations do not involve maintenance of track and signaling systems to meet the needs of the desired quality of passenger service. In such cases with state-supported Amtrak lines, public investment in rail infrastructure and operations has been needed (Bing et al 2010, 57).

General Best Practices

Each Situation is Unique. A consistent, explicit theme throughout the research is that each situation will have a unique set of physical, economic and political conditions, and, thus, there is no “cookie-cutter” approach or single standard agreement that will suit every situation (GAO 2004, 3; Prozzi 2006, 2; AECOM 2007, 2). Nevertheless, there are common elements to successful shared corridor arrangements.

Trust and Bargaining. Key to any negotiation is a sense of mutual trust based on open dialogue and good communication throughout the relationship (Prozzi 2006, 2). Ironically, this openness and trust is also contingent upon confidentiality, notably concerning public statements made by public officials (Bing 2010, 16).

However, because the public entity is typically dependent on the private owner, the public bargaining position must be maximized without alienating the private party (Dornan 1983). This can come in the form of support by high-level elected officials, commitments to public funding and capital investment, and securing the services of experienced negotiators (Prozzi 2006, 2-3).

And in some cases, a perceived “monopoly attitude” or “freight rail attitude” held by the freight entity can be a major impediment to a positive relationship. In such cases, regulatory leverage, while perceived as hostile, may be necessary to overcome the reluctance of the freight managers (Liu 2005, 166-167).

Experienced Negotiators. Shared-use agreements are complex and experienced negotiators are essential for success. Public sector negotiators with freight rail engineering industry experience are especially useful for effectively addressing railroad concerns and anticipating challenges (Prozzi 2006, 3).

Brock and Souleyrette (2013, 14) note that project planners and local policymakers serve as transfer agents collecting and disseminating best practices through networking with colleagues, shared project consultants and information gathering trips.

Any passenger service intending to obtain access using Amtrak must involve Amtrak from the beginning of the process. Amtrak staff usually have existing relationships and experience with the freight railroad staff that will be invaluable for a successful negotiation (Bing et al 2010, 14-15).

Forward Thinking. Agreements usually contain both short-term and long-term provisions pertaining to operations and capital investments. However growth in freight and/or passenger traffic can change both the economic and operational parameters of the arrangement, necessitating provisions for revision of agreements, including compensation for the opportunity cost of additional freight service that cannot be provided due to passenger traffic. This is something that needs to be anticipated by all parties at the outset of negotiations (AECOM 2007, 2; Bing 2010, 73).

Negotiations should be undertaken with an assumption of success for both passenger and freight operations. This will open consideration of long-term needs for both parties and how the economic and technical demands of meeting those needs can be met and incorporated into the agreement structure. Likewise, rights and responsibilities should be clearly explained under the assumption that the current representatives may not be involved when future challenges must be addressed (AECOM 2007, 3).

Given the potential long life of passenger service once established, passenger agencies may wish to negotiate arrangements that can exist in perpetuity, while freight railroads are inclined to be much more wary of constraining future business opportunities or relying on unreliable streams of public funding (Prozzi 2006, 3).

Clear, Realistic Goals and Objectives Goals incorporated into agreements should include capacity, speed, reliability, conditions and cost. Providing clear metrics for assessing the achievement of these goals and addressing failures to achieve goals are essential for a healthy relationship (Prozzi 2006, 3). However, it is also critical that these goals be realistic and sincerely shared (AECOM 2007, 3).

Examples of Best Shared-Use Railroad Agreements

Both passenger and freight rail experts agreed that a resounding example of a good agreement is the 170-mile Capital Corridor service from San Jose to Sacramento. The service is run by Amtrak for CalTrans, mostly on Union Pacific tracks. Experts noted a few reasons for the success of this agreement and service. First, the state brought a lot of capital to the table to upgrade the tracks and provide improvements that would benefit freight and passengers. Second, the Capital Corridor Joint Powers Authority (CCJPA) hired an executive director with “superb” technical and managerial expertise, a keen understanding of freight rail needs and passenger rail needs, and an ability to resolve conflict. The service incrementally added more trips as ridership grew and the state invested more funds in the corridor.

The Seattle Sounder was also listed as one of the best agreements. The Sounder is regional rail service between Everett and Seattle and Lakewood in the state of Washington. Burlington Northern Santa Fe (BNSF) owns the track and operates the passenger service for Central Puget Sound Regional Transit Authority (SoundTransit). This agreement works because the transit agency came to the railroad after strong planning with a clear goal- to take a lane of traffic off Interstate 5 during peak periods. The passenger service brought over \$350 million in capital for track and signaling improvements, and has incrementally added capacity rather than trying to start out with a large number of trips.

Some experts stated that commuter rail operations run by freight in general are better agreements because they have fewer conflicts and interferences. The Chicago Metra services and the Seattle Sounder are examples of services where the freight railroad operates the passenger service. Other corridors mentioned as best examples were the Minneapolis North Star because they tackled capacity incrementally. Mostly passenger rail experts cited the agreement with BNSF and the Southern California Regional Rail Authority (SCRRA) as a best example because of successful capacity modeling and adding capacity to the system. However, it was also cited by the freight railroad as an agreement that does not work.

Examples of the worst shared-use railroad corridor agreements

Between Los Angeles and San Bernadino, the SCRRA operates approximately 40 trains per day, and Amtrak operates about 20 trains per day. The BNSF and SCRRA are currently preparing to renegotiate the terms of this contract. The freight railroad said this agreement was problematic because there were few provisions for sharing the cost of maintenance. In other words, the passenger service pays very little of the maintenance costs. The contract also contains no provisions to permit changes in the schedule or to mediate disputes. The agreement was enacted in 1992 and is in effect until both parties agree to renegotiate. The fact that the agreement is being rewritten shows that it is not working for either the freight or passengers.

Agreements that involve absolute curfews, like the ones in Chicago where freight trains cannot run for certain peak periods in the morning, are generally considered bad for the railroads. These agreements were made when freight traffic was lower in this corridor, and the railroads have learned from the past that it is bad for business and no longer accept absolute curfews as part of an agreement. The biggest challenge to agreements is when things change in the future, and there is no flexibility or ability to change. Such flexibility would help to keep conflict low.

Most agreements that failed to get reached were because of a lack of money. Several examples come from Amtrak. The Sunset Limited Route on the Union Pacific from New Orleans to Los Angeles operates three times per week, and Amtrak wanted to upgrade to daily service, but they did not have the capital of over \$750 million that the UP quoted. The Rockford to Quad Cities Amtrak route in Illinois also failed because of a lack of monetary resources and turnover in leadership at the department of transportation. Strong leadership can sometimes overcome funding issues because the right person can find the resources and brings a tenacity to complete projects.

The agreement involving the state of Florida and CSX over a section of the Tri-Rail commuter system was problematic because of disputes over replacing a single-track drawbridge and dispatching responsibilities along the line.

Economic Competitiveness

Past agreements in the 1970s and 1980s would undermine economic competitiveness for freight railroads today. During that time, railroads were shedding lines and had little expectation that the freight business would grow in the future. These agreements did not take into account the importance of capacity. More recent agreements highly value capacity to keep the freight economically competitive. Closing off one side of the tracks from business can affect economic competitiveness for the railroads. Some freight railroads prefer to share tracks, rather than corridor, so that this possibility is reduced.

Government Policy for Shared-Use Corridors

Most of the industry experts believe that shared-use corridor agreements should be entered into on a case-by-case basis with mutual agreement between the freight rail and passenger rail agencies. Government involvement is not necessary, according to the railroad perspective. The railroads think that any policy needs to reflect the fact that the railroads are private use corridors, and they have private property rights. Rather than promoting shared-use, government policy should be focused on how to achieve transportation goals in the most cost effective way, and sharing corridors might be one answer, but not always the best answer.

Best Practices

To summarize the best practices and policies in shared-use rail agreements from the expert interviews:

- **Capital:** The public sector must be willing to bring money to the table. A shared corridor means shared capital cost.
- **Understanding:** Both passenger and freight rail need a mutual understanding of each other's needs, but the passenger agency especially needs to be aware of railroad operation issues and norms of freight business.
- **Capacity:** Adding capacity incrementally is a good way to begin and later grow passenger service.
- **Maintenance:** The best agreements specify costs of ongoing operations and maintenance.

- **Modeling:** Use rigorous modeling such as Revenue Technology Services (RTS) to understand capacity constraints and build realistic schedules.
- **Expectations:** Approach the railroad with a clear goal, such as removing a lane of traffic from this interstate; however, do not approach the railroads expecting the right to operate there. This attitude will cause problems.

The Future of Shared-Use Agreements

The experts see the use of shared rail corridors continuing and increasing because of traffic congestion and population growth. Because of the high costs of creating new rail corridors, either along existing highways or along new routes, the use of existing railroad corridors is usually the preferred option for major metropolitan areas. Although there will likely be more corridor sharing, some see it becoming more expensive in the future. The expansion will likely occur as shared corridor rather than shared track. Shared corridors are likely to take on multimodal purposes as well, including hiking, biking, passenger, and freight rail.

Boston Case Study

Introduction

The shared use of commuter and intercity railroad corridors with freight providers today in the Boston region is different from most of the rest of the United States. This difference is due to three major factors. The strong history of shared railroad corridors in the region, the fact that almost all of the shared use railroad corridors in the region are government owned and operated, and the fact that there is not a lot of freight currently being moved by rail in the Boston region.

Historically in the Boston region, due to the early development of passenger rail service and the limited amount of space to build competing lines, railroad corridors have always been shared. Today, all of the current passenger railroad corridors in the region are shared, and have always been that way. However, the amount of freight traffic moving on them has changed.

Until 1964, though shared, all of the rail corridors in the Boston region were owned and operated by the freight carriers. In 1964, with the freight carriers in financial difficulties, the corridors began to be transferred to public ownership, specifically to the state of Massachusetts. By the early 1970s, nearly all of the major and some minor railroad corridors in the Boston area were owned by the state.

This transfer of ownership to the state was assisted by two significant government changes. The first was the July 1964 establishment of the federal Urban Mass Transportation

Administration (UMTA) and their provision of capital improvement funds. The second was the August 1964 creation of the Massachusetts Bay Transportation Authority (MBTA) by the Massachusetts legislature. The influx of capital money helped the state buy many of the freight lines. The creation of the MBTA expanded the service region from 14 communities (that the pre-MBTA agency the MTA was responsible for) to 78 communities, including for the first time, the commuter rail lines.

In 1965 the New York, New Haven and Hartford Railroad (NYNH&H) which operated freight and passenger service on the south side of Boston had filed for bankruptcy. In order to assist, the MBTA began subsidizing some of the commuter service and also bought eleven miles of the former Old Colony mainline in order to construct a new rapid transit line. In the early 1970s, the NYNH&H was merged with the Penn Central Railroad (PC) but both continued to have financial difficulties. In 1973, the state bought most of the remaining south side commuter lines from PC along with a number of abandoned lines that have since been restored. Though at the time the state owned the lines and the MBTA was responsible for them, PC continued to provide the passenger service. In 1976, the government-funded private corporation Conrail took over the PC and the MBTA bought all the passenger equipment. In the end of 1976, the Boston and Maine Railroad (B&M) which ran commuter service on the north side sold all its remaining commuter assets to the state. This railroad had filed for bankruptcy in 1970. With this sale, for the first time in the history of the region all of the commuter rail lines except for a small section from Framingham to Worcester were in state ownership. In 2012, the Framingham to Worcester section was purchased by the state completing state ownership of the entire system.

In 1981, the Northeast Rail Service Act forced Conrail to transfer all of its passenger and commuter operations to local transit authorities. The B&M, which still operated commuter service on the north side for the MBTA, won the south side contract which Conrail had been operating, and for the first time all Boston commuter service was operated by one entity.

This arrangement lasted until 1987 when Amtrak took over managing the commuter service from what had become Guilford Transportation Industries after Timothy Mellon purchased the B&M. Amtrak rather tumultuously managed the commuter service until 2003 when the Massachusetts Bay Commuter Railroad Company (MBCR) was created and won the new contract after Amtrak did not even bid. MBCR operated the commuter service until 2012 when they lost the bid to Keolis Commuter Services. Keolis took over operation in 2014 and currently have an eight year contract, with a possibility of two, 2-year extensions. Keolis is a French passenger transportation company that operates passenger transport services in numerous other countries around the world.

Boston Commuter Rail System



Boston's current Commuter rail system, known as the Purple Line is the sixth largest in country with a 2015 annual ridership of 32,592,500 passengers and an average 2015 weekday ridership of 122,100 passengers (APTA 2015b). The system consists of thirteen lines, two major stations (North and South), and 127 total stations (see Figure 6). The system is completely split with five lines going north originating from North Station and eight lines going south originating from South Station. There is no direct connection between North and South stations, though discussions for such have been ongoing for years, but never come to fruition.

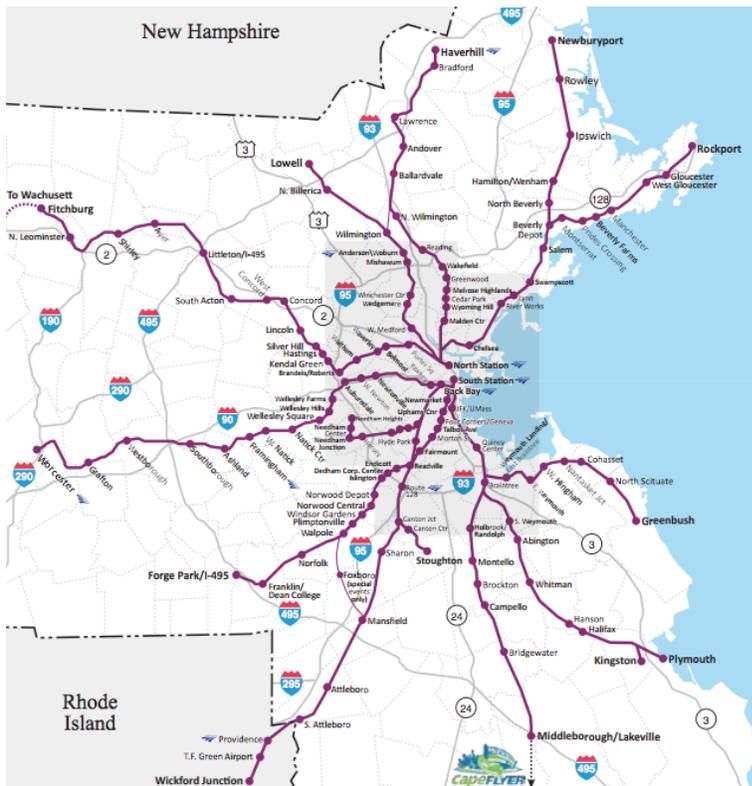


Figure 6: The Boston Commuter Rail System (Boston.com)

As previously mentioned, the commuter rail system in the Boston region is currently operated by Keolis Commuter Services. Keolis took the contract from the MBCR after they won a competitive bid in 2012. Keolis has an eight year contract with the possibility of two two-year extensions. The new contract is:

Designed to improve service reliability, (and) includes more stringent performance criteria and fewer acceptable excuses for service delays. (MBTA 2016).

The MBTA commuter rail contract is the single largest public transportation contract in the United States. As the contractor, Keolis is responsible for all commuter rail operations including dispatching except in the corridors where Amtrak or Pan Am (new name for Guilford) operates. Equipment used in running the service is owned by the MBTA, and the track on which the service operates is owned by the MBTA/State of Massachusetts.

Amtrak Downeaster



Amtrak's Downeaster is a 145 mile intercity passenger service that runs five daily trips from Boston's North Station to Portland, Maine with two of the trips continuing to Brunswick, Maine (see Figure 2). This service which at one time ran eighteen daily trips including nonstop express trips ceased operation in 1965 before reopening again on December 15, 2001. It is managed by the Northern New England Passenger Rail Authority and operated by Amtrak. Fiscal year 2014 total ridership was 536,524 passengers, a 4.6 percent increase over 2013. Fiscal year 2014 Average Daily Ridership was 1,481 passengers per day (Amtrak Downeaster, 2014).

North of Massachusetts, this line stopped running in 1965 when the B&M Railroad petitioned the Interstate Commerce Commission to discontinue all passenger services from Boston to Portland. Though service north of the Massachusetts state line did end, in

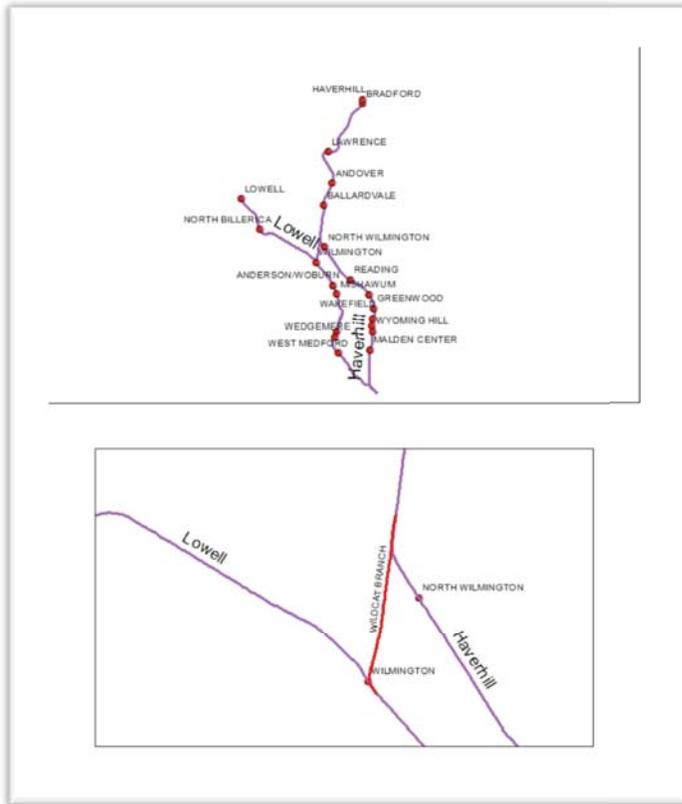


Figure 8: The Wildcat Branch

The current route of the Downeaster starts at North Station and runs in the Lowell commuter rail Corridor to Wilmington. There, the route leaves the Lowell Corridor and travels 2.8 miles on the Wildcat Branch to the Haverhill Corridor (see Figure 8). The Haverhill corridor is also the Pan Am Railways Freight Main Line. After leaving Massachusetts, it is this Pan Am Main Line corridor that is followed for service to the New Hampshire Seacoast and Maine. The Downeaster uses the Lowell route first before transferring to the Haverhill corridor to avoid conflict with local commuter stops on the southern portion of the Haverhill line.

The process of returning passenger rail service beyond Massachusetts to Portland began in 1990, and by the end of 1994, \$38.6 million had been appropriated for infrastructure improvements (Train Riders/Northeast 2008). In 1995, the Maine legislature formed the Northern New England Passenger Rail Authority (NNEPRA) as the responsible party to sign the final documents authorizing new rail service, and to be the manager for the new service. At that time, the general consensus was that service would begin in a couple of years.

Unfortunately, negotiations between NNEPRA, Amtrak, and Guilford Industries did not progress smoothly. Previously, B&M (Guilford) and Amtrak had fought over track

improvements in Vermont with the final outcome that B&M had the track condemned out from underneath them, and given to another provider. Not surprisingly, this soured them in general towards Amtrak, and when the Downeaster was proposed to operate on their lines they were not inclined to cooperate. Finally, in 1996 Maine's Governor, the state of Maine, federal officials, and Amtrak submitted their differences to the federal Surface Transportation Board (STB) for a settlement. In 1998, the STB ruled that limited right of way improvements could begin, even though differences of opinion among the parties as to rail weight (115 pound vs 132 pound) and train speed (60 miles per hour vs 80 miles per hour) still continued (ibid).

In late 1998, an agreement on the rail weight issue was agreed upon by all parties through the STB hearing, with the final decision of a 79 Mile per hour speed on 115 pound track. Despite this ruling, early in 2001 Guilford denied Amtrak from conducting track testing and announced that it would not permit passenger train speeds greater than 59 MPH. After trying to negotiate with Guilford, Amtrak went back to the STB for what they hoped this time would be an expedited hearing on the issue. In the end, Guilford did allow Amtrak access to the track for testing, but the maximum speed remained set at 59 miles per hour, because of the lighter gauge track. In August 2007, top speeds were increased from 59 miles per hour to 79 miles per hour with all parties finally agreeing.

Freight Movements

Compared to most of the rest of the United States, there is a minimal amount of rail freight moved around and through the Boston commuter area. Not only is the total number of freight trains that operate small, the length of those trains are short (max 50-100 cars). It has been many years since the Boston region was a major rail freight center, and over the last 25 years the freight volumes being moved by rail have been decreasing even more. There are occasional situations that lead to short term increases on an individual line, but generally it is much more common to see a passenger train than a freight train in the Boston area.

There are two primary reasons why there is not a lot of rail freight moving in the Boston region. First, Boston is a region of end users or a "destination-based region" and thus there is no rail freight traffic that moves through the region without stopping. Second, much of the mainline rail freight traffic that used to come in to the region has moved to the periphery. For example, in 2010 CSX moved its main freight operations from the Allston section of inner Boston 40 miles west to Worcester. This change allowed the commuter service on that line to expand. However, in order to make this change, CSX had to expand their Worcester freight facility. Since the passenger service was also a beneficiary of this change, the state participated in the expansion of the Worcester terminal through a private-public partnership.

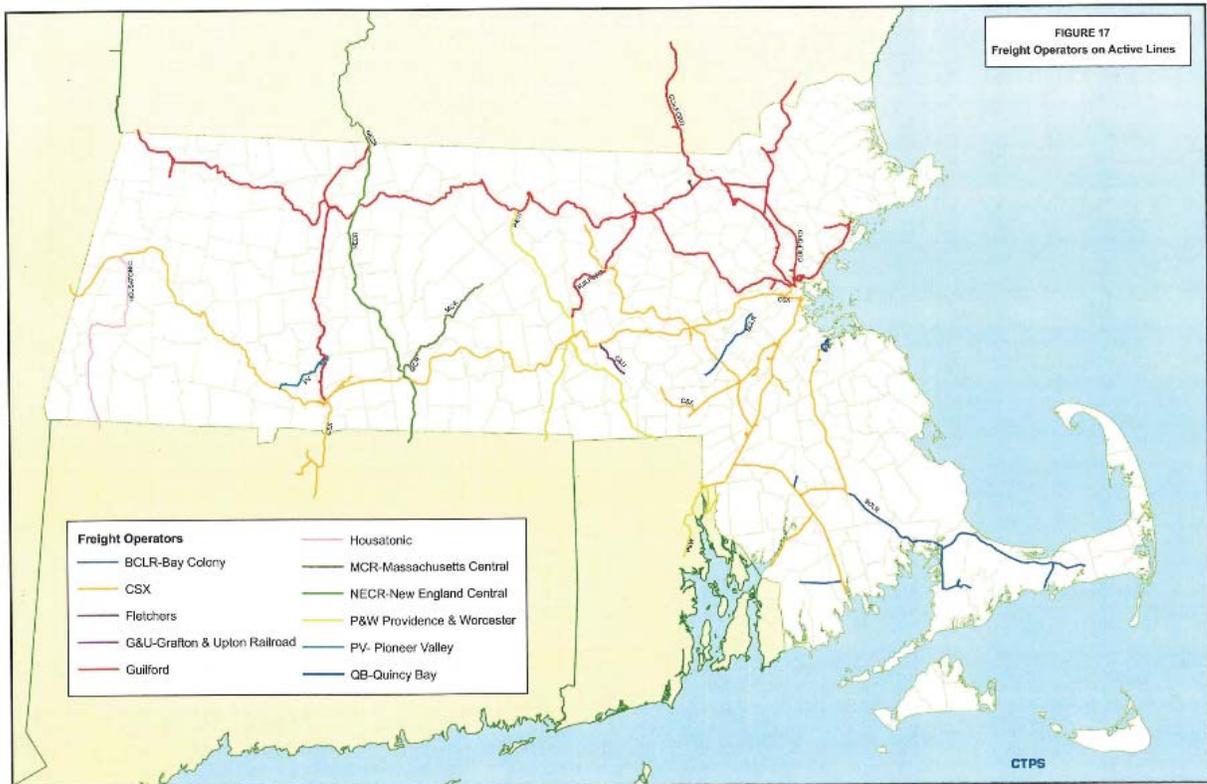


Figure 9: Freight Operators (Guilford is now Pan Am) (Boston MPO 2008)

Short haul freight is moved on all of the commuter lines in the Boston system except the outer Greenbush line and above the Beverly-Salem Bridge on the Rockport-Newburyport line. The busiest shared corridor is a five mile stretch on the outer Lowell line where, 30 commuter trains, ten Amtrak trains and ten freight trains operate daily. Though currently much of this area is single tracked, because of the heavy shared use, double tracks are being added in most of the area through funding from Massachusetts, the federal Recovery Act and the NNEPRA.

On the north side of Boston, the Class II Pan Am Railways is the freight rail operator (see Figure 9). They run the most visible of all short haul freight movements in the Boston region. This is the four daily trains moving sand and gravel to and from the Boston Sand and Gravel facility just north of North Station. These trains are visible because of the central location of the Boston Sand and Gravel facility. However, they have minimal impact on passenger service since they run between the hours of 9:30 PM and 5:00 AM.

On the south side of Boston, The Class I CSX is the major rail freight carrier moving cargo over much of the former New Haven Railroad territory. The major types of freight shipped

by CSX are intermodal goods including automobiles, and containers carrying general merchandise, municipal waste, chemicals and transflow freight. Also providing freight rail service on the south side are the Providence & Worcester (P&W) Railroad and the Bay Colony Railroad. The P&W ships many different products including automobiles, chemicals and construction materials. The Bay Colony's principal business is the movement of municipal waste (Boston MPO 2008).

Shared Use Agreements

The shared use agreements currently in place between the commuter rail and the freight rail carriers are the same now as they have been historically. Even with the change of track ownership from the freight carriers to the state of Massachusetts, the agreements were not revised, as the change was generally just a land transfer. With these historical agreements, both passenger and freight service have the right to operate on the track. However, with the change to ownership by the state, there is no question that the party in the stronger position today is the passenger operations. Regardless, the freight carriers still hold the rights to operate on these lines and must be allowed to do so, though at the purview of the MBTA.

With the track sharing agreements between the carriers being historic, there are many situations in which significant research is required to answer questions and/or resolve problems. Often, it is found that the old agreements can't adequately address current situations, and thus on the spot negotiations are required. The biggest change is that now with the state owning the track, the passenger service has the priority on the lines, where before the ownership change this was usually not the case.

The shared use of the Downeaster rail corridor by Amtrak and Pan Am today is much more cordial and cooperative than in the past. All of the parties now seem to have recognized the importance each holds to the other and are willing to look at the benefits each may provide to the other rather than the detriments. Running the B&M sand and gravel trains to the Boston Sand and Gravel facility just north of North Station only at night is an example of this cooperation. Operation agreements that include on time performance incentives benefiting all parties if met are another example. Everything is operating so well in this corridor, that another trip between Portland and Brunswick is being added in September 2016 and discussions on adding another round trip from Boston to Portland are in process (Bell 2016)

Economic Competitiveness

Because of the limited amount of freight that is moved in the region and the fact that the corridors are owned by the passenger operation, it was stated that the current shared corridor agreements have minimal impact on the economic competitiveness of either party.

Regardless, it was noted that there are times that the two entities could work together better for the improvement of both. Certainly the moving of the CSX freight operations to Worcester from Alston using a public-private partnership to rebuild the Worcester facility is an excellent example of what can happen when the two do work together.

The current commuter operations in the Boston region certainly have significant concerns related to the economic operation of their service, but little if any of these concerns are related to the shared use of the commuter corridors by the freight carriers. Instead, it is issues related to maintenance, operation and funding that are causing the economic problems. Remembering that in 2003 Amtrak, after operating the commuter service for six years, did not even bid to continue in this role shows how economically challenging it is to operate commuter service in Boston. In the first year that Keolis operated the service they lost \$29.3 million (Trains 2016).

Best Practices and Policies

The following statements were made regarding best practices for track sharing in the Boston region:

- Both parties have to have a good working relationship, and work well together
- Both parties have to be knowledgeable about the other's business operations
- The party that owns the track will dictate the policies that are put in place
- If contentious, it's the MBTA's property, so they will win!
- Realistic expectations lead to realistic results
- Recognize that cooperation can benefit both parties

Worst Practices and Policies

While at this time there were no “worst” practices and policies mentioned oriented to the shared track agreements within the Boston commuter rail system, this was not the situation found with the development of the Downeaster line. There, B&M, the freight carrier at the time was not pleased to have passenger service restored on its line and thus made it as difficult as possible for the change to occur, putting up roadblocks at all possible points. According to several sources, this lack of cooperation primarily stemmed from historical disagreements between B&M and Amtrak, and a cantankerous owner who was not interested in cooperating. Interestingly, today ownership has been transferred to the former owner's

son who has been very accommodating to the passenger service, and supportive of changes to help both services grow and improve.

The Future

Due to the unique nature of the situation found with shared corridors in the Boston region, according to the interviewees, there will probably be few significant changes in the future. The amount of either passenger or freight volume is not expected to increase significantly and there are few system changes planned for the future. In addition, with passenger service so dominant and in control of the track, and the demand for freight in the area small, there are few driving forces for any future major changes.

Regardless, the one area for potential future change that was mentioned was the need to improve upon the lack of specificity in the current agreements between the two parties. It was stated that these agreements are “general to a flaw” and that “often up to twenty percent of my time is spent trying to clarify unclear issues from the past”. It was also stated that in the future when the track sharing agreements are reworked, adding more direction and clarity would be extremely beneficial to parties on both sides.

Case Study Conclusions

In the final conclusion, the shared use of rail corridors by passenger and freight railroads is done overall successfully in the Boston area today. This sharing has been in existence since the railroads first began operating in the region, and many of the “current” sharing agreements date back quite far. The fact that there is not a lot of freight moving in the Boston area today due to most handling facilities being located on the periphery and no through freight rail traffic helps makes this success more easy to accomplish. Having the lines owned and controlled by the public passenger service puts them in the driver’s seat which is very beneficial to passenger service since they run most of the trains operating in the corridors.

There are no major changes to the current sharing agreements planned for in the near future, even though having old agreements does often require on the spot negotiations. The sharing of rail corridors is not really impacting the economic competitiveness of either party. The best practices for conducting successful track sharing all relate to cooperation, realistic expectations, and the fact that the MBTA owns the track. There is really very little change expected in the future in regards to track sharing currently in the Boston region, and overall everyone interviewed was very supportive of the current situation.

Chicago Case Study

Introduction

The history of passenger and freight rail in the Chicago region is among the most complicated in the entire country. As one of only two cities to host six of the seven Class I railroads, the complexity of freight rail alone is considerable. Union Pacific, Burlington Northern Santa Fe, Norfolk Southern, CSX, Canadian National, and Canadian Pacific all meet within the region, not to mention dozens of short lines and regional railroads. Public transit includes eleven commuter lines on Metra that terminate in four different downtown stations, plus the South Shore Railroad from Indiana. All of these lines share rail corridors with freight railroads in a variety of different configurations stretching across three states. Amtrak has thirteen lines that originate or terminate at Chicago's Union Station. None of these lines transit through the city, but they do cover the country coast to coast, as well as regional destinations in all directions. Amtrak's lines all share tracks with other railroads, sometimes with multiple freight railroads along a single corridor. Finally, Chicago's rapid transit system, the "L", also includes shared corridors along three of its eight lines, some stretching back more than a century.

The long history of rail transit in this region means that almost every possible configuration of corridor sharing is present, providing a rich case study into the possibilities and limitations of sharing. This history also means that many of those past arrangements would not be possible today because of changed federal requirements and industry standards, as well as the changing fortunes of the railroad industry. Indeed, future expansion of both Metra and CTA transit systems, as well as Amtrak, is limited by the need to share corridors.

The history of shared-use corridors in the Chicago area is in some sense as old as the existence of railroads. Passenger traffic and freight traffic were carried by the same railroads until the economic crises of the 1970s. The same spinoff of passenger rail at the national scale that led to Amtrak's creation led to the establishment of commuter rail systems in northwest Indiana and northeast Illinois. The varying economic conditions of the railroads that were bought out, went bankrupt, or persevered from this time set the stage for today's current conditions on commuter rail lines. The complex jumble of ownership and infrastructure has meant many long delays for passengers and freight alike. The public-private partnership of the CREATE (Chicago Regional Environmental and Transportation Efficiency) project has improved infrastructure in the metropolitan area to reduce delays. But much work remains to be done to ease intra-regional and inter-regional rail travel now and into the future, beginning with better cooperation in planning and operations alike.

Historic rail connections in the Chicago region

Chicago's history as a city of rails has been well documented. The rapid rate of the city's growth in the late 1800s is often attributed to its rail connections to the sites of Midwestern resource extraction on the one hand (including timber, wheat, and cattle), and the Eastern and overseas markets for manufactured goods on the other (Cronon 1991). Historically, one or two main lines formed a solid connection to eastern markets, while a fan of lines spread out from north to west to south to capture as much of the hinterland as possible. Northwestern Station and Union Station on the west side of the Chicago River handled traffic from the west and north, while Central Station on the south edge of the central city was where the Great Migration ended for thousands of African-Americans following the Illinois Central up the Mississippi Valley.

Commuter service within the metropolitan area was initially provided by the railroads. Suburbs from Winnetka to Arlington Heights to Mokena to Homewood grew around stations along the various tracks, an extension of the "streetcar suburb" concept to a distance of thirty to forty miles from the city center. The Elgin, Joliet, and Eastern formed a belt line about fifty miles outside of the city center, serving the industrial complexes of Gary, Joliet, Aurora, and Waukegan, among others, and providing some limited passenger service as well (Lewis 2008).

Within Chicago itself, the famous "L" loop within downtown began as a way to connect existing elevated rail lines that stopped just short of the city center. In time, the "Loop" became shorthand for the central business district. However, the privately owned railroads that operated the elevated lines and streetcars eventually became insolvent, and the Chicago Transportation Authority was created in 1947 to maintain passenger transit service within the city.

One of the city's shared-use corridor agreements dates from this time period. The Green Line branch along Lake Street had been extended westward past the city limits around the turn of the twentieth century. To do so, it shared a right-of-way with the Chicago and Northwestern Railroad, running at street level adjacent to the elevated railroad. In the 1960s, an agreement was made with Union Pacific to allow the Green Line to be brought up onto the embankment on abandoned track alongside the UP mainline. The Green Line runs up there today for the five westernmost stations, its lines immediately adjacent to the UP tracks. Such an arrangement would not be possible today because the CTA cars are too light-weight compared to freight cars (not Federal Railroad Authority or FRA-compliant). Nevertheless, interviewees indicated that the CTA's lease of the UP tracks continues to be renewed as a grandfathered exception to the rule.

Creating the modern, separated system

By the late 1950s, after a decade of residents moving to the suburbs, and jobs eventually following them, demand for commuter service to the city center was declining. Some lines like the Chicago, Aurora, and Elgin, or the Chicago, North Shore, and Milwaukee, were closed entirely (These were later among the first rail-to-trail projects in the U.S., today's Illinois Prairie Path and Green Bay Trail.) In order to survive, the remaining railroads requested permission in the 1960s and 1970s from the Interstate Commerce Commission to discontinue their passenger service.

Within the Chicago region, there was great interest in maintaining commuter rail service from the suburbs to downtown. So at the same time that Amtrak was being formed to ensure the continued provision of passenger service at a national level, the Regional Transportation Authority (RTA) was created in Illinois and the Northern Indiana Commuter Transportation District (NICTD) in Indiana in order to, as one interviewee put it, "provide a mechanism to fund deficit operations for passenger rail service." A decade later, Metra was spun off as the Illinois agency in charge of commuter rail operations in the Chicago region.

Because this transition from private to public rail service depended on the economic health of the various railroads at the time, the nature of the agreements on sharing corridors within Chicago is almost unique to every corridor. Looking at Metra's lines starting in the north and going counterclockwise, we see a variety of arrangements:

- UP-North (to Kenosha, WI): rolling stock owned by Metra, trains operated by UP employees, track owned by UP, dispatching by UP
- North Central (to Antioch, IL): rolling stock owned by Metra, trains operated by Metra employees, track owned by CN (Canadian National), dispatching by CN
- Milwaukee District North (to Fox Lake, IL): rolling stock owned by Metra, trains operated by Metra employees, track owned by Metra, dispatching by UP
- UP-Northwest (to Harvard, IL): same as UP-North
- Milwaukee District West (to Big Timber Road, IL): same as Milwaukee District North
- UP-West (to Elburn, IL): same as UP-North
- BNSF Railway (to Aurora, IL): rolling stock owned by Metra, trains operated by BNSF employees, track owned by BNSF, dispatching by BNSF

- Heritage Corridor (to Joliet, IL): rolling stock owned by Metra, trains operated by Metra employees, track owned by CN, dispatching by CN
- Rock Island District (to Joliet, IL): rolling stock owned by Metra, trains operated by Metra employees, track owned by Metra, dispatching by Metra (including a small amount of freight)
- SouthWest Service: (to Manhattan, IL): rolling stock owned by Metra, trains operated by Metra employees, track owned by Norfolk Southern (NS) and Chicago Northwestern Indiana (CNI) , dispatching by NS and CNI
- Metra Electric (to Blue Island, University Park, and South Chicago, IL): rolling stock owned by Metra, trains operated by Metra employees, track owned by Metra, dispatching by Metra (no freight)

Additionally, the South Shore Railroad is owned, operated, and dispatched by the Kensington and Eastern from a point along the Metra Electric Line until the Indiana border, where NICTD owns, operates, and dispatches the line (including some freight) the rest of the way.

Of these lines, only the Metra Electric and SouthWest services do not directly share track with freight railroads. Both Metra and NICTD therefore use rolling stock that is FRA-compliant along all of their lines, meaning it is of the same weight class as freight cars to minimize damage in case of a collision. However, most of these lines are dispatched in such a way that regular sharing of the same track does not actually occur. For example, during morning and afternoon rush hour, commuter trains have dispatching priority. Depending on the railroad, some are more likely to maintain this priority outside of rush hour than others. In some cases, outright curfews on freight traffic during peak periods have been established. A few lines such as the Heritage Corridor are limited in the number of trains they can offer per day because of this sharing of space and the lack of double tracks or sidings. Other lines such as the BNSF are limited during midday or in the reverse commute options they can offer because of the high use of the corridor by freight traffic. Extending service along any of these lines can involve negotiations not only with the railroad that shares the track or corridor, but with others that intersect the line, such as the former Elgin, Joliet, and Eastern, now owned by CN.

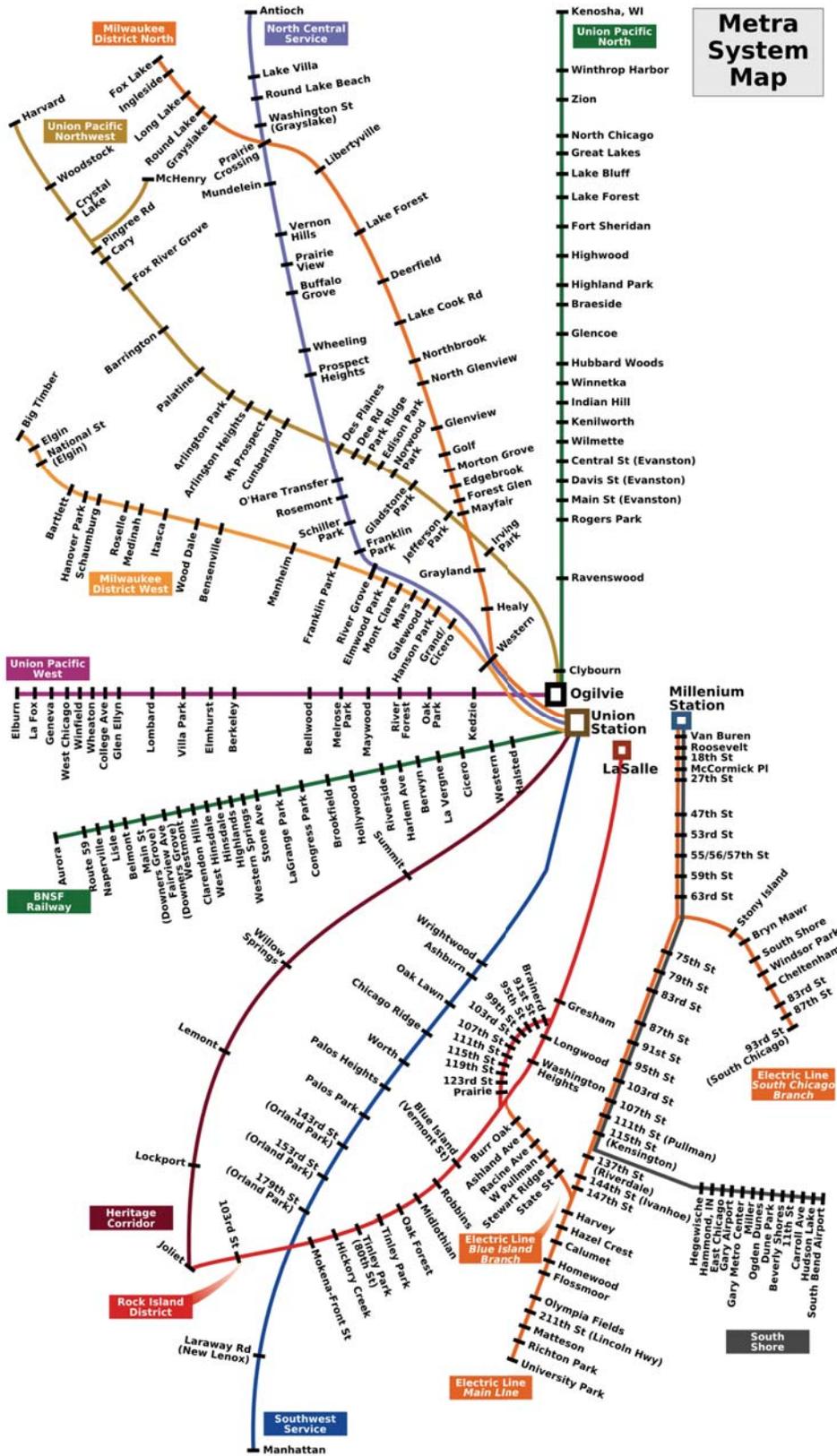


Figure 10: Metra map by: Peter Fitzgerald CC-BY-SA-3.0

Amtrak service throughout the region also shares rail corridors and sometimes tracks. Although Amtrak was created to provide passenger service on a national scale, any corridor of under 150 miles is also funded by the state or states it passes through. About half of Amtrak's Chicago-based lines meet those requirements, necessitating negotiation not just with railroads, but with the states of Illinois, Indiana, Michigan, and Wisconsin. However, Amtrak has the advantage over commuter rail of statutory rights of access: as long as Amtrak does not "unduly interfere with freight operations," they are to be given priority. In practice, as with Metra, that priority is not always given, but the statutory right means that Amtrak can make a complaint to the Surface Transportation Board if the railroad is not living up to its end of the agreement. Though interviews suggested this happens rarely, Amtrak did complain to the STB in 2014 after two years of failed negotiations with Canadian National over on-time performance on the tracks they share to Champaign-Urbana and Carbondale, and they have also registered complaints about eastward service on tracks owned by Norfolk Southern and CSX. Amtrak also has the statutory right to purchase access at only the incremental cost of maintaining the track for higher-speed passenger trains. This is unlike commuter rail, which has to lease or buy track at fair market value, something that often makes expansion prohibitively expensive.

Expanding lighter rail transit

While Chicago's "L" system is generally considered heavy rail and not light rail, its vehicles nonetheless are not FRA-compliant. Therefore, extension or expansion of the system into spaces shared with freight rail is even more fraught than for Metra and can shape the form that new lines take. When the Orange Line was being developed in the 1980s, the city of Chicago had two options: a subway beneath the heavily-traveled Archer Avenue, or a part-elevated, part at-grade line close to Archer utilizing existing and/or abandoned rail track. The city went with the latter option, buying track from the Belt Railroad, Indiana Harbor Belt, and the Santa Fe Railroad. (The Chicago Transportation Authority operates the rail system, but the Chicago Department of Transportation does much of the station and line work, including establishing leasing and purchasing agreements with railroads.) Although this option was much cheaper, it meant that the line follows railroad tracks past industrial areas, not existing commercial and residential nodes. This tradeoff between available right-of-way and what the right-of-way passes is something to be considered when utilizing old rail lines for new transit, with their industrial history.

The Orange Line currently terminates at Midway International Airport. The original plan called for the line to continue south for another five miles to a major shopping center, but funding ran out in the 1990s before the line could be completed. More recently, the city has been negotiating with the Belt Railroad to buy the remaining land necessary to complete the

extension. This would put the Orange Line closer to an active rail line than at any other point along its length (it runs adjacent to a UP line closer to downtown, separated by a chain-link fence). However, it would still be separated by at least fifty feet from Belt Railroad trains, which is acceptable according to the FRA.

Another line extension that has been less successful thus far is the Red Line, straight south from the city center. It currently terminates at 95th St., which is the busiest station on the "L" system, leaving another four miles south along the corridor unserved by rail transit. Once again, the city faced the choice of building along a significant commercial street or using existing railroad track. In this case, however, Halsted Street would not have a subway, but an elevated line. Due to community opposition to an elevated line, the parallel UP line has been designated as the preferred alternative. Unfortunately, negotiations with UP to share the right-of-way were unsuccessful. The corridor is 100 feet wide, and although the two UP tracks currently in place take up only 30 feet, the UP insisted on a 50-foot buffer with any CTA tracks because of the relatively lighter rolling stock of the Red Line. That would leave 20 feet for two tracks, which is not enough. As of mid-2016, the CTA was negotiating to purchase a new right-of-way alongside the UP's property which would give them sufficient room for the Red Line tracks. Interviewees were hopeful that an agreement would be reached, since the far south side of Chicago is in desperate need of the Red Line extension.



Figure 11: Shared-use corridor, Chicago Photo Credit: Julie Cidell

CTA L System Map

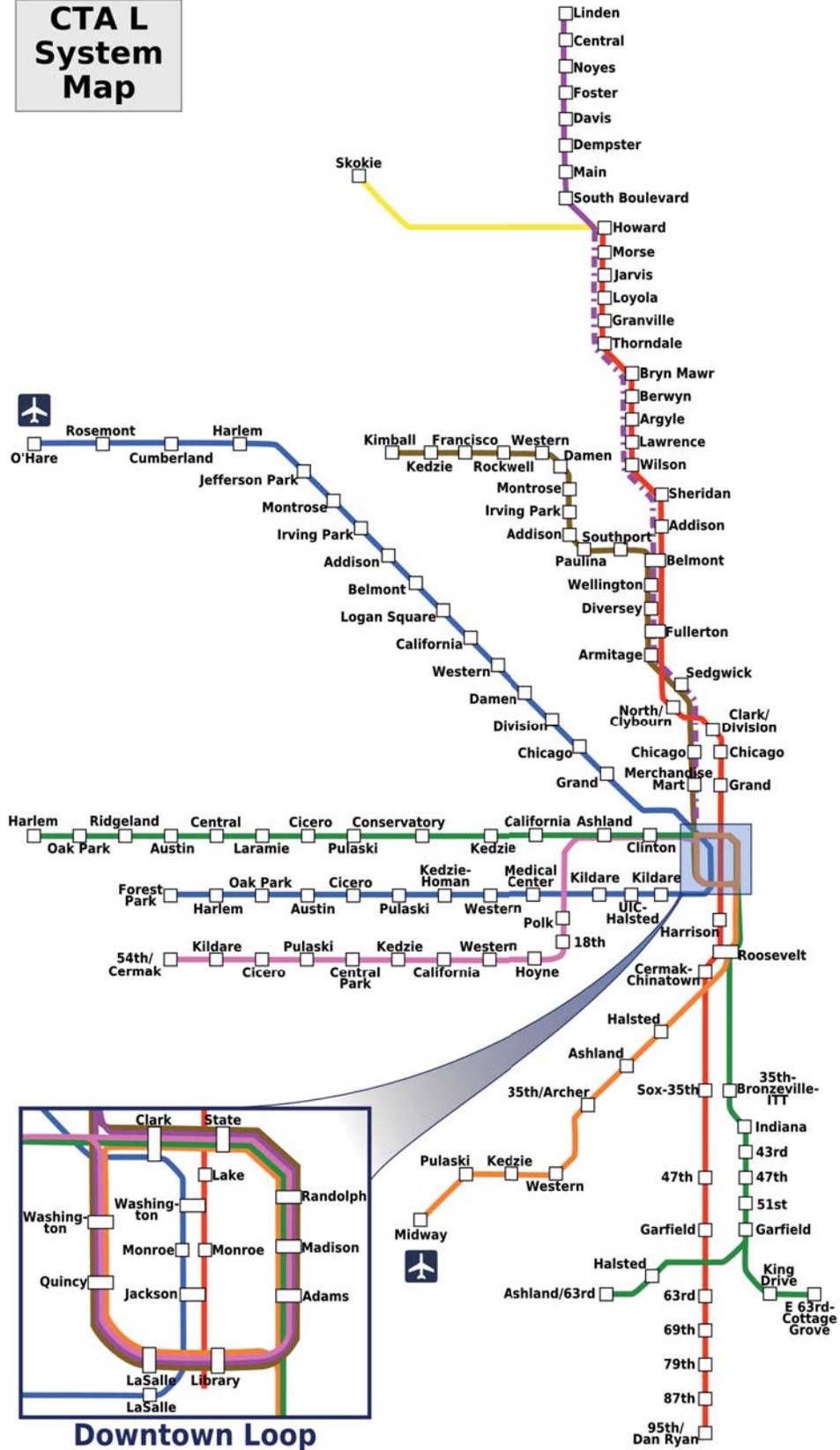


Figure 12: CTA L system map by: Peter Fitzgerald CC-BY-SA-3.0

Expanding heavy rail transit

Aside from issues of shared corridors and rights-of-way, a related concern in the Chicago region is a different kind of shared rail space: interlockings. Where railroads cross, long delays can occur, especially as trains grow in length to one or two miles long. As mentioned above, this can be a limitation to expanding commuter rail service farther out from the city, especially if the belt line being crossed is heavily trafficked. Grade crossings with roads might not bring trains to a stop, but they do delay road traffic and pose hazards to impatient motorists and pedestrians. Grade crossings are a significant safety issue in the Chicago region—though not in the city of Chicago itself, which from a very early time required grade separations on most rail lines within the city. Nevertheless, reducing intersection points is another way in which passenger and freight railroads can reduce conflicts.

To deal with this complex network of railroads and infrastructure and the delays it can cause to the entire national rail system, a unique arrangement was developed: the Chicago Regional Environmental and Transportation Efficiency project, or CREATE¹. It is a partnership between five of the six Class I railroads in the region, two smaller regional railroads, Amtrak, Metra, and federal, state, and local governments. The idea was to make infrastructure improvements that would simultaneously benefit freight and passenger traffic, as well as the neighborhoods through which the lines pass. Among the variety of improvements (including signaling, road underpasses, and upgraded switching systems) are six different rail overpasses to separate passenger and freight traffic. The most significant is the Englewood Flyover. Where Metra's Rock Island line with its 78 daily trains used to cross the Norfolk Southern line with its 46 freight trains and 14 Amtrak trains per day, the Rock Island now passes over the NS line. Additional flyover projects in this area will not only reduce passenger and freight delay, but increase the speed of both types of train and make it more likely that high-speed rail between Chicago and St. Louis will be built. The economic modeling behind CREATE estimates that overall passenger and freight benefits will be split fifty-fifty, though commentators have noted that the projects finished so far have leaned more heavily to the freight side. This could be because Metra and the local governments have been slow to produce funding on their end.

Future expansion possibilities along Metra lines include extending beyond the current six-county region in a number of directions: south to the proposed third Chicago regional airport; west to DeKalb and Northern Illinois University, or to the growing suburbs of Oswego and Yorkville; and northwest to Rockford. There is also a group within the city of Chicago pushing to change the Metra Electric line to more frequent service, emulating the "L" rather

¹ <http://www.createprogram.org>.

than commuter rail. Unlike Metra's other lines, the Electric makes multiple stops within the city, some only half a mile apart. Converting this line to rapid transit might replace the proposed Red Line extension, made more difficult by the thus-far-failed negotiations with the UP to share their corridor. Metra already owns the Electric track, and if it maintained its current rolling stock, it would not have to negotiate with CN, the other user of the corridor.

In Indiana, the NICTD has been land-banking six miles of bankrupted railroad since the 1990s that will soon be used for a new extension to Munster and Dyer, along the state line. Negotiations to share track for part of that extension with CSX failed, in part because the South Shore is electrified, which would have required installing catenary wires. But CSX was also concerned about liability issues and possible conflicts with usage, and so the NICTD is building two miles of new track alongside of CSX to connect to the section they already own.

Best practices for shared corridors

Given the complexity of rail networks and infrastructure in the Chicago area, along with the significant shifts over time in the fortunes of the railroad industry and the consequences for sharing corridors with passenger traffic, it is hard to draw conclusions about what does and does not work. Nevertheless, interviewees and previous studies of the region alike offer some suggestions that other regions might find useful.

For one, there is an unfortunate paradox that often exists in the timing of cooperation. From a corridor planning perspective, collaborating with the freight railroads does not usually happen until the details of operations and engineering are being worked out. For projects involving the use of federal funds, transit agencies cannot even engage with interested third parties or private property owners such as the railroads until after the environmental assessment process is completed. This runs the risk that the railroad will raise its asking price for access, since only Amtrak has the statutory right of incremental cost. However, railroad representatives who were interviewed indicated their resentment at finding out from newspapers or other media that plans have been made to share one of their lines with new or expanded transit without asking them first. They therefore advocated incorporating the railroads in discussions as early as possible in order to smooth the entire process.

Another type of coordination that is extremely important is dispatching. In Chicago, with the nine different railroads that control track shared with passenger service, as well as others that interlock, a journey of a few miles can require dozens of conversations. For example, from the time Amtrak's southern Illinois service enters the suburbs roughly thirty miles from the Loop, it encounters seven different dispatching centers along the rest of its journey. In 2015,

Amtrak commissioned a blue ribbon panel to produce recommendations on how to improve its on-time performance in the crowded Chicago region when it doesn't control the tracks on which its trains travel. Not only that, the dispatchers themselves are often physically distant, located at railroad headquarters in Nebraska or Texas. Amtrak's top recommendation, above streamlining environmental review, fully funding CREATE, and improving operations within Union Station, was to coordinate dispatching. While joint dispatching remains a sensitive issue among the railroads, one consequence of Amtrak's report (and a similar report produced by the freight railroads but not publicly shared) was to establish a Chicago facility with a representative from each railroad at least in the same building, if not directly coordinating their actions.

Other interviewees pointed to Metra's two lines on which it owns the track but not the dispatching rights; there is relatively little freight traffic on those lines, but the agency remains frustrated with the situation, a legacy of how the existing lines were sold in the previous century. Not only ownership of the rail, but also control of the dispatching, is therefore a key point of contention that both freight and passenger rail organizations will fight to maintain. Furthermore, when an agreement is reached, it might be in the best interests of both sides to be vague about the split of traffic to allow flexibility over time. Metra's North Central line is owned and dispatched by CN under an agreement that includes the precise number of trains each can use per day, and the hours of the day when passenger trains can be present. This obviously limits future expansion unless a new agreement can be struck.

Other findings are perhaps self-evident. For one, commuter service is easier for sharing a corridor than light rail service because the rolling stock is FRA-compliant. In the heavy rail vs. light rail decision, this is something that needs to be considered if a corridor is to be shared, as railroads are not allowed to share with significantly lighter vehicles. Other suggestions were to offer upgrades to signaling or to build additional track or siding as a way to compensate railroads, something beyond the straightforward economic calculations of delay or labor costs from sharing track space.

Finally, one perhaps more subtle influence on cooperation among passenger and freight railroads has less to do with the subject matter being negotiated and more to do with the people doing the negotiating. Roughly half of the people interviewed in the Chicago area had worked for one of the other agencies or companies under study. This included people with private sector railroad experience moving to passenger agencies, people moving between different transit authorities, and people moving from city or federal government to regional agencies. Besides the personal networks they maintain as they move, easing informal contact between organizations that might be at odds with one another, these people also bring the

perspective of the "other side" to their new position. Perhaps this will make it easier for future shared corridor agreements to be reached in the Chicago region and elsewhere.

Denver Case Study

Introduction

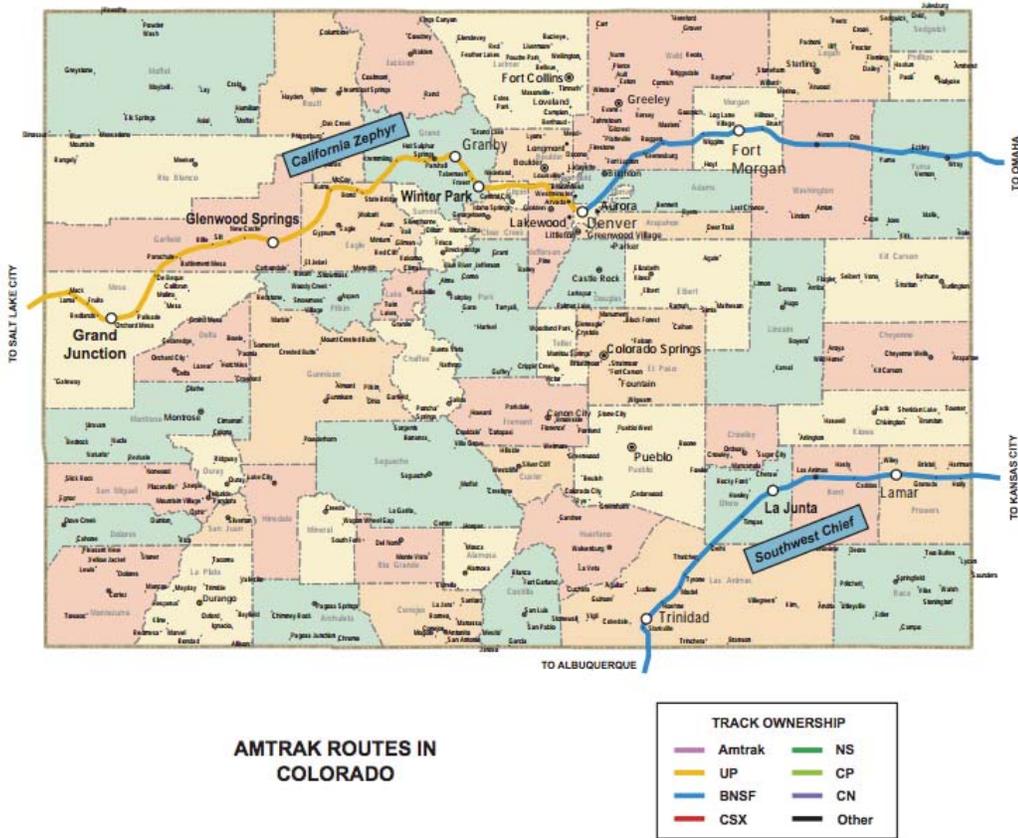
Colorado has a rich history of freight and passenger rail operations. The state currently has two long distance, intercity passenger rail services operated by Amtrak: the California Zephyr and the Southwest Chief routes. The services operate on shared track with both Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) railroads. This report focuses on the recent negotiations between BNSF and Amtrak to continue the Southwest Chief service in Colorado.

While the Denver metropolitan region has a long history with railroads, its use of shared corridors for regional commuter rail service is fairly new. The Regional Transportation District (RTD) is the transit agency for the Denver metropolitan area, and in 2004, passed a new regional rail transit system plan called FasTracks. Voters approved the FasTracks plan which proposed six new rail lines in the Denver area, five of which were proposed to be built at least partly within freight rail corridors, with funding from an increase in sales tax. Most of the FasTracks rail lines have already been built or will open by 2018 except the Northwest rail line². The following sections will analyze the nature of the FasTracks sharing agreements and acquisitions as well as the impediments to reaching an agreement on the Northwest line.

Amtrak

Amtrak operates along two routes in Colorado: The California Zephyr, connecting Chicago and San Francisco, and the Southwest Chief, connecting Chicago and Los Angeles. The California Zephyr operates along shared tracks with BNSF and UP from the northeast into Denver, and along the Union Pacific tracks west of Denver to Salt Lake City. The Southwest Chief operates primarily over BNSF track in the southeast corner of Colorado. Although Amtrak has legal right to operate over any freight or passenger rail track and priority is given to Amtrak trains by law, as one interviewee put it, "whoever controls the switches, controls the railroad; the reality is [Amtrak] can't move until whoever owns the switches gives them permission." This reality can lead to contentious agreement negotiations and ongoing operations if there is not a partnership mindset between the parties.

² Find more information at www.rtd-fastracks.com.



—Amtrak Government Affairs, summer 2011

Figure 13: Amtrak routes and stations (Amtrak 2015)

In 2010, the future of the Southwest Chief in Colorado seemed to be in jeopardy. According to the Colorado State Freight and Passenger Rail plan (CDOT 2012), BNSF announced to Amtrak that it would no longer maintain the tracks between Hutchison, KS and La Junta, CO to speeds of 79 mph, and if Amtrak wanted to run its trains at speeds higher than 60 mph, Amtrak would have to pay for the increased maintenance cost. BNSF also stated that Amtrak would be responsible for all maintenance costs for the track between La Junta, CO and Lamy, NM. Amtrak continued to run the service and bear the additional maintenance costs for several years. Later, BNSF further reduced the speed to 30 mph for safety on some segments of track because of the track’s poor condition, and their argument was since their freight does not need to run at higher than 30 mph, Amtrak should pay to run at a higher speed. Amtrak and BNSF had discussions about rerouting the Southwest Chief out of Colorado altogether through Kansas, Oklahoma, Texas, and New Mexico, but several communities in Southeast Colorado that would lose Amtrak service banded together to “Save the Chief.”

The response to the efforts to continue the Southwest Chief service in Colorado is a good example of cooperation and partnerships. The process of renegotiating Amtrak's contract with BNSF started off as contentious, with BNSF levying demands. Amtrak alone did not have the funds to continue to pay additional maintenance costs or to improve the track. Through a partnership of federal Transportation Investment Generating Economic Recovery (TIGER) grants and matching funds from state and local governments, BNSF, and Amtrak, an agreement was reached that benefited all the stakeholders. In total, TIGER grants of over 48 million dollars were awarded to allow Amtrak to maintain the line as well as replace decaying tracks. BNSF has pledged to pick up the cost to maintain any portions of the track that are improved for the next 20 years. The value of BNSF's contribution is over 111 million dollars over the 20 years, saving Amtrak and the states future maintenance costs. The funding package reflects cooperation amongst the BNSF, Amtrak, local communities, and state governments. Since improving the line, Amtrak has improved their on-time performance and improved the run time by over 90 minutes along this segment. BNSF has also experienced improved quality of service.

Regional Transportation District (RTD)

The first RTD rail line to use a shared freight corridor was the Southwest light rail. This line was built in 2000 and shares 11.8 miles of right of way (ROW) with either BNSF or the UP railroads in a consolidated main line. This is a true shared corridor where BNSF, UP, and RTD own different portions of the corridor, and everyone has tracks on each other's property. RTD bought fee interest from Denver Rio Grande, which after multiple mergers in the 1990s, became Union Pacific by the time of closing. On BNSF property, RTD purchased a passenger easement.

The West rail line was the first FasTracks line to be opened in 2013 and operates light rail within an abandoned consolidated freight rail corridor that RTD acquired through an outright purchase in the 1980s from the Colorado and Southern, a predecessor to Burlington Northern. Freight no longer operates in this corridor.

The Gold line (G line) corridor is an electrified commuter rail line that will open in late 2016 and includes two sections of shared corridor. From Pecos Street to Sheridan Boulevard, RTD bought two miles of forty foot wide right of way from Union Pacific, and from Sheridan Blvd to Golden and the Coors property, RTD owns the entire corridor and grants an operating easement to BNSF. The current Gold line does not run all the way to Golden, but there is potential for future expansion because of the purchase of the additional property.

In the summer of 2016, the B line opened as an electrified commuter rail line and is the first six miles of the Northwest Rail line. It currently runs on portions of right of way purchased from BNSF from Pecos Junction to Westminster Station

The North Metro line is an electrified commuter rail along the Boulder Industrial Lead (BIL), which is former UP right of way. RTD purchased the entire corridor right of way, which extends 33 miles north to Erie, although only the first 13 mile segment of the proposed 18.5 mile line identified in FasTracks is currently under construction. The Union Pacific no longer operates in this corridor. The 13-mile North Metro line is scheduled to be opened in 2018.

The A-line along the east corridor to Denver International Airport is one of the more complicated shared corridors. From Denver Union Station to York St., RTD bought all required right of way adjacent to either the BNSF or UP. From York to Airport Blvd, RTD bought a forty-foot wide right of way from UP. In practice, the UP and RTD operations exist as independent corridors because the UP operates on their own property while RTD operates on their own property, but in reality, they are only separated by a fence so it is a shared corridor in practice.

Northwest rail line is the only of the FasTracks lines where the freight railroad and transit agency could not reach an agreement for shared use, although that is not the only reason the line is stalled. Lack of funding for RTD was a major issue that required the agency to prioritize the FasTracks build out based on availability of federal funds, cost, and ridership benefits. The proposed rail line would go over BNSF right of way, and it is the only RTD rail line that would involve shared track for portions of the corridor. Further discussion of the Northwest Rail line issues follows in the next sections.

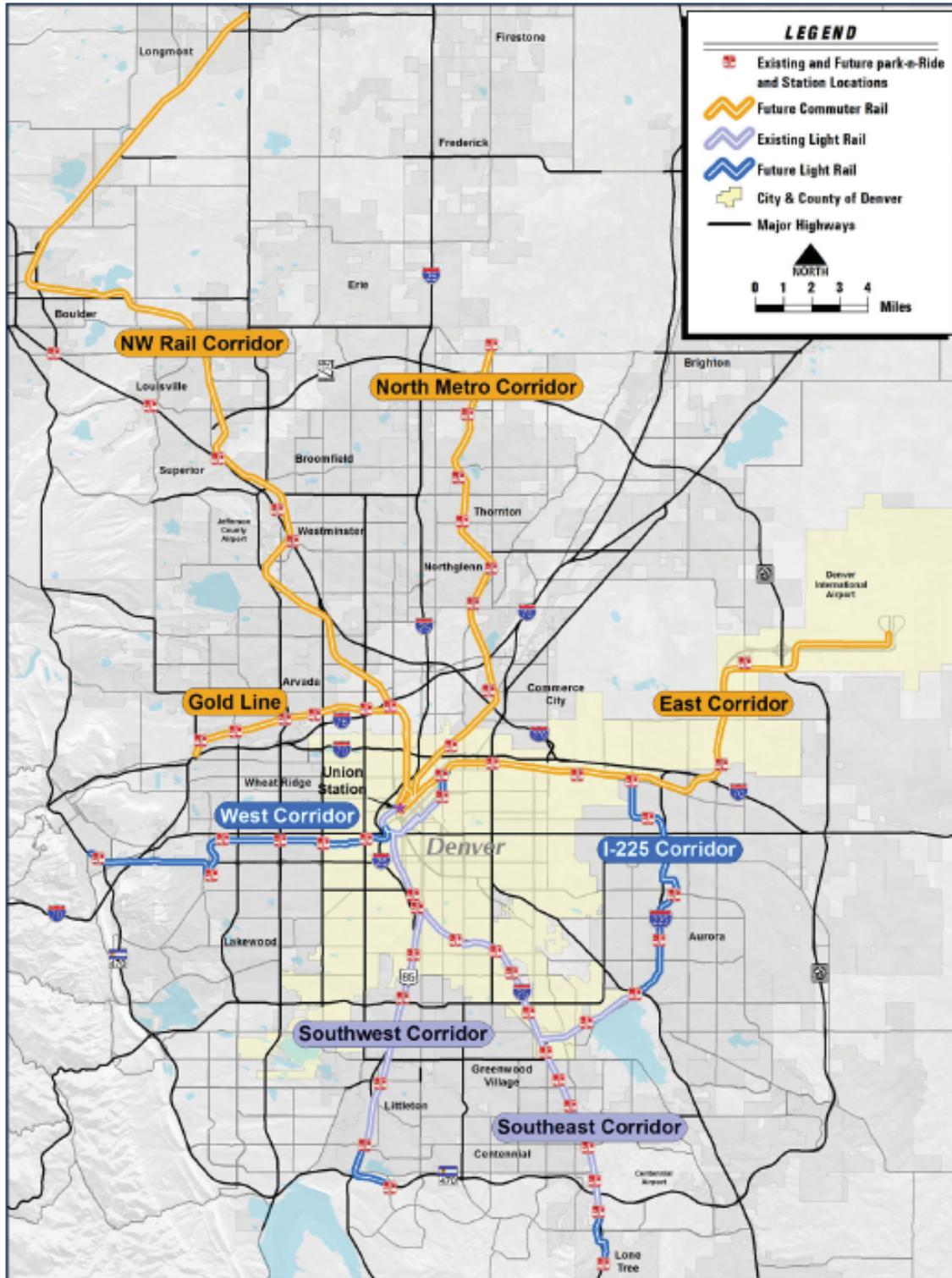


Figure 14: FasTracks corridors (CDOT 2012)

Agreements and corridor sharing development process

Recent FasTracks corridor sharing deals involved three basic parts: (1) purchase of the real estate interest, (2) relocation of freight rail and construction of passenger line, and (3) ongoing operation and maintenance and shared corridor use agreements.

Real estate interests The process of developing a corridor sharing agreement begins by approaching the freight railroad with a general plan for rail development to see if the railroad would be willing to sell or share part of their right of way, corridor, or track. These “feasibility discussions” for the FasTracks plan with BNSF and UP took place prior to the 2004 vote on the sales tax increase. These discussions are very general and meant to determine whether or not the freight railroads would be willing to participate in further negotiations, and if there is even a right of way or corridor that could be shared. The freight railroads will not engage in detailed engineering until there is a sure source of funding and detailed plans from the transit agency emerge. When RTD approached the railroads about options for corridor sharing, it became clear early on that shared track would not work because of the time sensitive nature of the passenger rail service that RTD and the community desired.

In addition, for the transit agency to receive federal funding for a project, the agency is not allowed to enter into a legal contract to purchase or share the rail corridor until the federal environmental impact assessment (EIA) is completed. The environmental process for some of the corridors began prior to the 2004 vote and others after, and the process is meant to rule out other alternatives to the planned construction in the rail corridors. Before and during the environmental process, the transit agency is not able to engage with interested third parties or private property owners such as the railroads, other than basic feasibility discussions. After the EIA, plans for construction and realignment may change based on community input and environmental factors, and the best situation/ alternative is chosen. The environmental impact statement (EIS) is then publicly available for everyone, including the freight railroads, to view, and only then can the right of way be purchased with funds designated under the plan. A transit agency could, however, use other funds proactively to secure access to freight rail corridors for proposed passenger operations as part of a "landbanking" strategy.

The limitations on private railroad involvement prior to environmental assessment have a significant impact on the ability of the freight railroads and the transit agency to reach an agreement. It makes it very hard to negotiate with the railroads when there is a document stating what type of service the transit agency has decided to provide. One respondent said that RTD would have been able to negotiate better agreements if they had not had a document that already identified their intended plans to the railroads. The railroads knew that

RTD had committed the rail lines to the voters, and that they intended to build in the freight right of way, thus providing the railroads with the upper hand in negotiations. An alternative approach would be to amend the environmental process to allow the freight railroad to be a participant from the beginning, to allow negotiations and establish realistic cost estimates for access to the right of way first, and then continue with the environmental assessment process.

In recognition of the unfortunate paradox that often exists in the timing of cooperation, some flexibility in implementing regulations for NEPA has been introduced. Implementing regulations allow for 'categorical exclusions,' i.e. actions that have been presumed, based on history and frequency of occurrence, to have no significant impact on the environment. Furthermore, in 2012 the FTA introduced a change in their implementing legislation that provides for corridor preservation before completion of NEPA. Specifically, 49 USC 5323 states:

(q) Corridor preservation.--

(1) In general.--The Secretary may assist a recipient in acquiring right-of-way before the completion of the environmental reviews for any project that may use the right-of-way if the acquisition is otherwise permitted under Federal law.

(2) Environmental reviews.--Right-of-way acquired under this subsection may not be developed in anticipation of the project until all required environmental reviews for the project have been completed.

Passenger agencies should always seek the advice of their regional FTA, FRA, and/or other relevant federal offices before pursuing this course of action. There can be no development of the corridor property, only the acquisition. Compliance with NEPA is paramount and non-compliance could kill a project, so passenger agencies must be careful in how they proceed with corridor preservation. Nevertheless, these approaches can be useful in addressing corridor access issues.

There are a few corridors where RTD was able to buy the right of way or corridor prior to construction and the environmental process. The West line was purchased during the 1980s as corridor preservation, but it was bought from base RTD funds. The Gold line is scheduled to run from Denver Union Station to Wheat Ridge at Ward Road. RTD was able to purchase an additional six-mile long property along the BNSF corridor beyond Ward Road all the way to Golden at the Coors Brewery. In addition, RTD is only building the first 13 miles along the UP corridor of the North Metro line, but purchased 33 miles of the corridor up to Erie.

These landbanking acquisitions will enable RTD to expand the lines in the future if population growth demands it. In the future, corridor preservation purchases would make sense and prevent negotiations with railroads from stalling rail lines, but the funding issues are the problem. Future sales tax revenue from the FasTracks funds cannot be used to purchase property not included in the FasTracks plan, and federal funds cannot be used to purchase corridor property unless the federal environmental review process is followed.

Relocation and construction. The freight railroad and the transit agency must also reach agreement on where and how some of the freight facilities will be relocated. The original plan for the A-line to the airport was to relocate UP totally out of the corridor that RTD purchased, but after the EIS, it became cost-prohibitive to rebuild facilities up to new code and technologies. RTD and the Union Pacific reexamined the design and ended up with a different alignment that still worked. The needs of both the freight and passenger agencies must be taken into consideration for relocation and during construction, and everything comes at a price.

Operation and maintenance agreements The BNSF calls these agreements “joint corridor agreements” and the Union Pacific calls them “O & M agreements,” and both provide for ongoing operations and maintenance issues that arise such as insurance, drainage, indemnity, emergency coordinations, and the construction of future additional facilities in the right of way. Previous agreements or acquisitions made in the 1990s did not involve all of these elements. Operations and maintenance were not discussed with Union Pacific in the Southwest light rail corridor deal. It was a “we take care of ours, you take care of yours” situation that was not formally agreed to in a contract. At the time, there were not as many freight and passenger rail shared use agreements, but today, the freight railroads have seen the value of including operations and maintenance terms in their agreements.

The Contentious Process of Developing a Shared-Use Agreement

When asked whether the development of corridor sharing agreements were contentious, the general consensus was yes, all agreements were contentious but most were ultimately successful. None of the corridors were described as easy negotiations where everything fell into place, but agreements were reached in all corridors except the Northwest, which had a variety of issues that prevented the passenger rail from being implemented. In order to be successful in negotiating an agreement, the transit agency needs staff members who understand the operations and infrastructure requirements of freight rail. The passenger agency lays out the plan for what they want to do in the freight corridor, shows how it will not affect the freight and if it does, how to mitigate the impact on them. Having someone at the table that speaks the railroad’s language, knows the business, and realizes that the freight

railroad is there to make money will create a more cooperative relationship. Dealing with freight in an honest, one-on-one basis with good interpersonal skills makes a big difference in reaching an agreement.

Cost is generally the main sticking point in negotiations. Everyone comes to the table needing things, RTD has a limited amount of funds, and the goal is to reach a deal. Prior to the 2004 FasTracks vote, RTD generated a cost estimate for all the corridors based on preliminary design plans and a rough 10-20% estimate, usually a gross cost per mile. Prior to meeting with freight railroads to negotiate a price for property acquisitions, the agency only knows the cost of their own facilities, but not of relocating freight facilities, upgrading technology or track that must be moved. The price of the real estate can be determined, but other factors can affect the cost that RTD originally estimates for a corridor or for an acquisition. Another contentious issue in agreement negotiations is how to preserve service to local freight rail customers. This is sometimes done by relocating the customer, building a flyover to retain freight access, or other creative solutions, but it must be addressed and paid for in the negotiations.

Northwest rail line

The public saw the Northwest rail line negotiations as especially contentious because of rising cost estimates for sharing the corridor, but RTD points out that cost changes came about on their side of the negotiations as well. The Northwest rail line is proposed to run from Denver Union Station to Boulder and Longmont northwest of Denver along a BNSF freight corridor. The line was included in the FasTracks plan, some argue, to get the votes needed in the jurisdictions to the north to pass FasTracks. Even before the recession of 2008, several factors affected the cost estimates and funding sources for the Northwest rail. A combination of a shortfall in sales tax revenue and increased costs for construction commodities jeopardized all of the proposed FasTracks lines, but innovative financing structures through public-private partnerships and federal funding enabled the other lines to move forward. The ridership in the Northwest corridor was always projected to be low, and because of the low ridership, low population density, and competition from RTD's bus rapid transit (BRT) service to Boulder, the line was not eligible for federal funding. This left some people in the northern communities to feel that they were paying for FasTracks, but getting no rail in return.

RTD approached BNSF to design a system that could handle projected RTD operations in the BNSF corridor. Unlike other corridors in the FasTracks plan, RTD could not acquire the entire right of way or corridor because there is barely room for two tracks, and BNSF still needed to move freight in the corridor. RTD was negotiating for time slots on the freight

tracks where the railroad would retain the infrastructure and guarantee RTD could move their trains. RTD says that BNSF came back with a fair number, but that the number kept changing over time. Some of the cost increases came from changes requested by RTD in the original design after the 2004 vote and after the EIS. Communities wanted more stations, quiet zones, grade separations, and bigger Park and Rides, and the level of service was changed to 55 trains a day. The equipment was changed from diesel locomotive-hauled coaches to electrified commuter rail, which also required a different type of maintenance facility.

In addition, the freight traffic on the line had nearly doubled since 2004, so additional capacity improvements that the freight railroad needed would cost much more than RTD had anticipated. Additional right of way would be needed for more sidings and more overpasses to maintain capacity for freight trains that were as long as two miles. Positive train control (PTC) was a new safety technology that needed to be implemented but was not previously figured into the cost estimates. When original estimates were derived more than five years before, there were different economic conditions, different capacity needs for the freight, technology changes, and operational changes. All of this contributed to rising costs in the corridor.

RTD says the biggest challenge with this corridor is its length. The Northwest corridor is over 40 miles long, much longer than most of the other corridors, and an increase in the cost per mile is compounded over 40 miles of track. In 2004 RTD initially budgeted \$66 million for access to the corridor, but by 2012 BNSF announced that it would cost \$535 million. With other operational and technology changes, the total cost for the Northwest rail line jumped from \$461 million in 2004 to \$1.7 billion by 2012 (Migoya 2012). A railroad representative stated that their cost estimates for sharing corridors are generally good for only one year, and after that, new costs need to be determined in order to reflect changes in capacity, freight flows, and other economic determinants. In order to reach a successful agreement, the railroads need to know that the transit agency has a committed, reliable source of funding. When the sales tax revenue fell short of projection, RTD was uncertain of the time frame in which the Northwest line would be built. RTD says it needed to know the costs from the railroads before it could determine when the line can be built and if it had funding. BNSF said that they could not produce detailed engineering plans and negotiate an agreement until RTD had certainty in funding and a short to medium time frame to ensure that the railroad protected its interests for future capacity needs. RTD blamed BNSF and BNSF blamed RTD, and they went in circles. This then spilled over into the newspapers, where the “dirty laundry” from the discussions was aired out in public. When parties do not

protect each other's reputations in the media, it hurts future negotiations and ends the partnership mentality of agreement discussions.

To add to the situation, the communities along the corridor could not agree on what made sense in the corridor. Some of the mayors and elected officials were committed to BRT rather than rail, while other communities dug in their heels for a rail line. One elected official in the corridor stated that he felt BNSF could see the disagreement among local governments, and that Boulder, the largest city in the corridor, was not really interested in completing the Northwest line, so they determined there was not really a serious effort to complete the rail line.

Economic competitiveness

Nearly everyone agreed that bringing passenger rail to the Denver metropolitan region keeps Denver economically competitive with other cities. They believe that it brings development and employers to the region, citing the relocation of several national headquarters of companies to downtown Denver near the Denver Union Station transit hub and DIA. The value of fewer people on the highways and less congestion also increases economic productivity and competitiveness for the region. One passenger rail advocate even stated that freight rail does not drive economic development, it is passengers that do, and the service must be at least every fifteen minutes for economic development to occur.

The interviewees did not think that sharing rail corridors has a negative effect on freight railroads. By law, Amtrak is not allowed to impede freight traffic, and if it does, railroads can petition the Surface Transportation Board. The consensus is that when negotiating agreements with passenger rail agencies, the freight railroads look out for their core business, moving freight, and they will not do anything that will detrimentally affect their ability to serve their customers. While some relocation or buy out of customers is necessary during relocation or construction, it is up to the railroads to ensure that their ability to run their service is not reduced. For example, in the east corridor of FasTracks, when RTD tracks went in on the south side of the corridor, it blocked access to a few direct freight shippers who had to make alternative transportation arrangements or use relocation money to relocate elsewhere along the railroad. However, it was stressed that the railroads would not have agreed to these terms if they thought it would make them suffer. RTD has tried to negotiate fairly with both railroads, the BNSF and UP, to keep the railroads whole, and not give either railroad any advantage over the other. These deals are voluntary for the railroads and they enter into the deals only if they can maintain their capacity. In the past, they have entered into agreements where they have curtailed their service, such as in Chicago when they allowed absolute curfews whereby the freight could not run their trains during certain peak

commuter hours. The railroads have learned from these past agreements that this does not work for future capacity concerns. There are also some positive impacts to economic competitiveness to the railroads sharing their corridors because such agreements can include eliminating or improving at-grade crossings. These types of operational advantages are good for everyone, as they help car traffic flow easier and the freight traffic move smoother through town without as much stopping and downtime.

Best Practices

The experts agree that it is important for the passenger agency to have the most accurate cost estimate possible, and to try to keep the costs from escalating too much. If costs change substantially, people get angry, and it causes concern for the passenger agency, the freight railroad, and the public.

One way to keep cost estimates more accurate is for the transit agency (RTD) to have an Intergovernmental Agreement (IGA) with every community along a corridor before entering into negotiations with the freight railroad. This helps to define what RTD is doing on the project, and what the community is doing on the project. For example, if a community wants sidewalk near the track and station, RTD may think it is the community's responsibility, the community thinks it is RTD's responsibility. Additional ROW may need to be purchased, and then costs go up. RTD learned from previous experiences, and they were able to negotiate IGAs for the North Metro line before entering into a RFP for that line. This helps keep cost estimates more accurate.

Think ahead about everything the agency might need from the railroad, and tie it all into one package. For example, the freight railroad may not be willing to negotiate small issues like grade separations and crossings or to sell smaller corridor segments unless it is tied to a larger deal. It is not worth the price to the railroads to process such small deals (the cost of paperwork, lawyers, etc.). RTD was able to get things packaged together that they otherwise would not have been able to get, while they have them at the table for larger acquisition deals.

The passenger agency needs to show how the railroad will come out ahead even before beginning discussions. They also need to show that they know what they are doing and what they are talking about in negotiations.

The transit agency needs to employ staff members who understand the operations and infrastructure requirements of the freight railroad, either as consultants or in-house employees. Passenger rail agencies must be able to see things from the freight perspective as

a business with stakeholders who need to make money. Approaching the railroad with honesty and good faith is the way to achieve good agreements.

Both the freight and passenger rail sides must have people who know the local rail issues, and not just send people from the headquarters, Fort Worth (BNSF) or Omaha (UP), to negotiate. The freight railroads benefit the most when the transit agency can help address local rail issues that the higher ups may not be aware of.

It is incredibly important for the passenger agency to be able to show that they have a secure source of funding and feasible time frame for project completion. The freight operations need to see that passenger rail is committed to completing the project in a short to medium timeframe to ensure that the costs are accurate.

One best practice for both the freight and passenger agencies is to not air out "dirty laundry" from negotiations. The two sides should be partners and strive to protect the reputations of both entities in the public eye. Pointing fingers or assigning blame for failures in negotiation talks can quickly sour any working or future relationship.

One expert suggested that all successful agreements are where the agency buys the ROW, as RTD did for all of its corridors except the Northwest line. He stated, "It is not a good agreement if you don't control the switches."

Several people suggested that incrementally adding capacity is the way to get good commuter service. Examples they pointed to were the Minneapolis North Star and Seattle Sounder services. Starting a high level of service, such as 55 trains a day, can disrupt the freight operations significantly and require much higher capital contributions for improvements.

The planning process should not take place in isolation, and the process needs to address passenger rail needs, highway needs, and freight flow needs. Collaborative planning can accomplish a win-win-win scenario, for example improved grade crossings. Freight rail and passenger rail need combined solutions, not one at the expense of another.

Future shared use corridors and future of agreements

Most people agreed that the most feasible and probable location for future shared corridors is along the Front Range running north and south of Denver. The interviewees had varying opinions of the breadth of a potential Front Range rail system, but it could generally span from as far south as Albuquerque, NM to as far north as Cheyenne, WY, closely paralleling Interstate 25. The more likely scenario is within 20-25 years, building Front Range Rail north

from Pueblo to Colorado Springs to Denver and on to Fort Collins, mostly along BNSF track with some UP trackage rights. This corridor would be suitable for passenger rail because population is expected to grow along the Front Range by over two million people in the next 25 years, from four million to six million. There is little room to expand the highway in key highway corridors in the region. The Colorado Department of Transportation conducted a study for multimodal transportation options, including commuter rail, along the northern section of I-25 from Denver to Fort Collins, and are preparing another statewide rail plan that will explore passenger rail options in other corridors (CDOT 2012).

According to RTD, Northwest commuter rail is still going to be built as part of FasTracks, when RTD has the money. Current estimates peg completion of the Northwest rail line sometime in the early 2040s. Additional corridor sharing projects beyond FasTracks are not on the horizon for RTD. Amtrak is considering expanding service from La Junta to Pueblo as part of a reconfigured Southwest Chief route, with current plans to begin thru car service to Pueblo in anticipation of this expansion. While some rail options exist to share track along Interstate 70 with UP running west from Denver, few people mentioned this as a likely option in the near future.

One recommendation from RTD staff was to preserve as much corridor as possible to avoid having to deal with negotiating these types of deals in the future, even though expanded rail service will likely not be needed for the next 20-25 years. The Northwest rail corridor was offered to RTD in the 1990s for “peanuts” when freight traffic was waning, but RTD did not have cash to buy it then. If they had, they would have been able to avoid the contentious negotiations for later acquisition of access to the corridor. The transit agency has tried to learn from this, and would hope to buy additional ROW along the corridors for future expansion.

Discussion of an eastern freight bypass to move freight rail activity out of downtown Denver waxes and wanes with the volume of freight flows. It could free up more capacity for passenger rail and more land downtown for redevelopment. Is there a cooperative solution for moving freight that can benefit both parties? The local experts see more cooperation in the future for freight and passenger rail because of pressure on both sides.

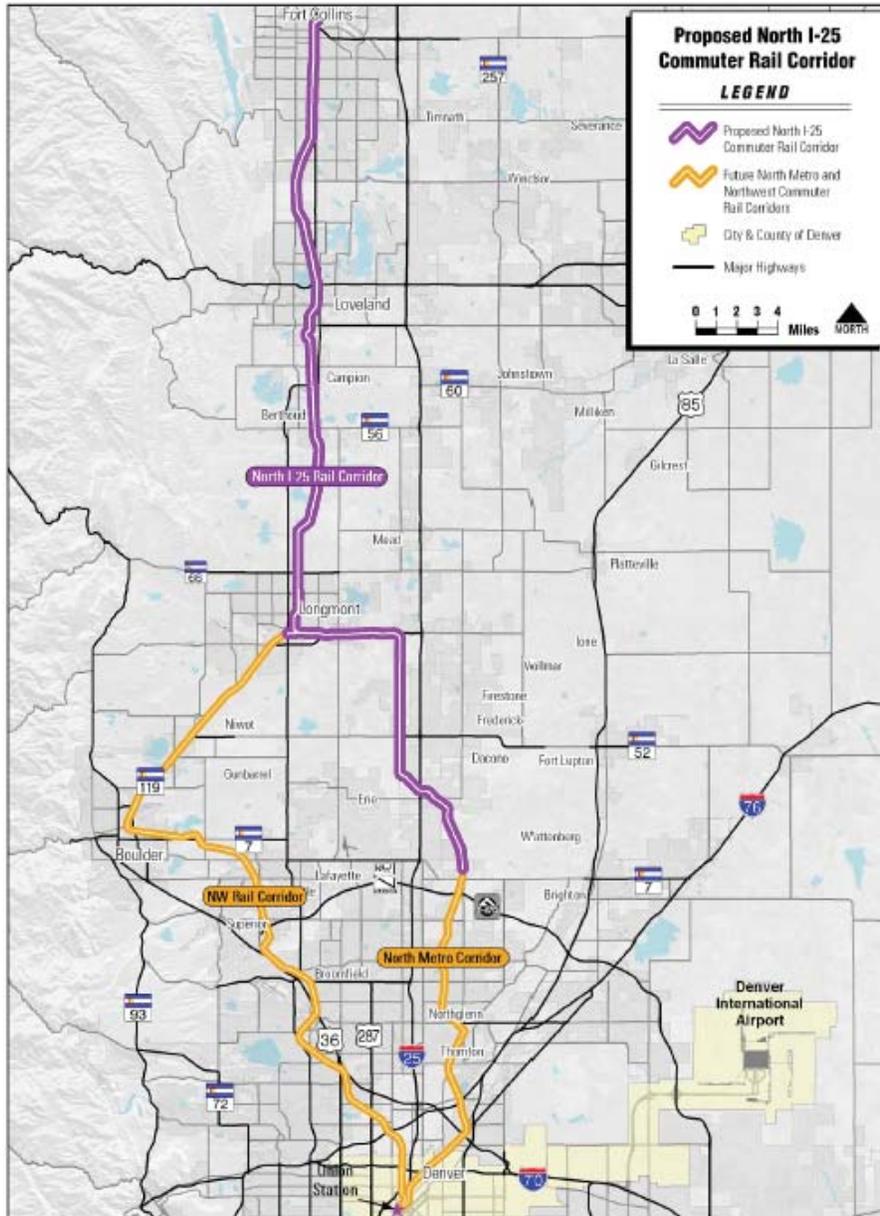


Figure 15: Proposed I-25 commuter rail, Northwest Area Mobility Study (CDOT 2012)

Government policy for Shared-Use Corridors

Most passenger representatives view more government intervention as positive, but they do not necessarily think the federal government should mandate policy for shared-use corridors. Shared-use corridors should be looked at on a case-by-case basis because shared-use does not make sense in all situations- it is only one tool in the toolbox for expanding passenger rail.

One way the government can support shared-use is through the continuation of federal grant and loan programs such as TIFIA, RRIF, and TIGER programs. The feds can also help by integrating services and facilitating cooperation and collaboration among agencies like the

EPA, HUD, and USDOT to improve innovation. The federal government should not intervene and dictate, but instead should facilitate cooperation amongst passenger and rail operations.

A few people had specific suggestions for how the government could get more involved in shared-use agreements. Passenger rail is not currently subject to the STB's jurisdiction (except for Amtrak interactions with railroads), but the STB or another national body could act as an oversight body to allow disputes or stalled negotiations between passenger and freight operations to come before them. Currently, if an agreement cannot be reached, then the passenger agency is the one that has to walk away. On the other hand, the general feeling is that the freight rail operators are smart people who will figure out a way to work with passengers to prevent the feds from getting involved. Another suggestion is for the federal government to amend the environmental process to allow railroads to be at the table during the EIA, so the passenger agency could have the ability to acquire ROW before the environmental process is completed.



Figure 16: Light rail and CML Lower Downtown, Denver Photo Credit: Julie Cidell

CONCLUSIONS

The issue of shared use corridors between passenger and freight rail operations continues to be extremely important in and between metropolitan areas in the United States. As demand for rail transit, commuter rail, and intercity passenger rail has been increasing in recent years, agencies responsible for providing service are faced with numerous challenges to extending route networks. One potential avenue for expanding passenger rail service is to utilize existing rail corridors that are typically owned and operated by freight railroads. As freight rail traffic has fluctuated on some of the corridors most in demand and in an effort to increase revenues, freight railroads have entered into agreements with passenger rail operators to allow access to their corridors for the purpose of providing passenger rail service. These agreements specify the terms under which public agencies are permitted to run passenger rail operations along freight rail corridors.

Because demand for passenger rail has been increasing, more attention is being focused on these corridor-sharing agreements and there is a clear need to conduct additional research on this topic. The purpose of this study was to identify issues, challenges, and best practices in shared use rail corridor agreements through a focus on three case studies in Boston, Chicago, and Denver. After a review of the relevant literature, a general analysis of shared corridors was conducted based on a series of interviews with national experts. Following that, researchers conducted more focused interviews with local area experts in each of the three case study cities. Based on the relevant literature, review of agency documents and data, and analysis of interview results, we present the following findings from our investigation and suggest several recommendations.

General Findings

Our findings were consistent with other studies in identifying key issues such as capacity, liability, cost sharing, capital constraints, and the special conditions related to Amtrak involvement in shared corridors:

- **Capacity.** It is critical to both the freight railroads and the passenger operators that a clear analysis of current and projected corridor use be made in order to assess capacity constraints. If projected passenger operations can be accommodated within a corridor given existing and projected freight use, then the chances for a successful agreement are good. If not, then capacity will need to be enhanced through infrastructure and/or other improvements, or an agreement will not be reached. One of the main reasons why some agreements have been problematic for both parties was the lack of adequate capacity analysis reflected in the agreement.

- **Liability.** Despite continuing efforts to improve safety in the rail industry, the possibility of life-threatening accidents looms over both passenger and freight rail operations. Both parties are less likely to engage in corridor sharing agreements unless liability issues and costs are adequately addressed. While the Amtrak Reform and Accountability Act of 1997 limited the aggregate allowable awards to all passengers against all defendants for all claims arising from a single accident or incident to \$200 million, freight railroads continue to have concerns about legal and legislative challenges to this limit and seek more insurance protection against potential claims. Freight railroads will expect that passenger operators assume additional liability costs to account for the added risk of running passenger service in an active freight rail corridor.
- **Cost sharing.** While an incremental (or avoidable) cost approach was previously established for Amtrak intercity passenger operations, that may not be appropriate for other passenger rail operations. An incremental cost approach assigns to tenants only those costs that could have been directly avoided if the user were not served. This approach may appear to be a less expensive option when available for commuter operations, but it can also result in inadequate corridor capacity and reliability, and, ultimately, a negative effect on the health and utility of both passenger and freight service. Attributable or variable cost approaches that include a proportion of total costs may be more appropriate.
- **Capital constraints.** Rail transport is a capital-intensive industry. Investments in the establishment, maintenance, and expansion of rail corridors are considerable. The priority of freight rail companies is to move freight in a profitable manner. Freight railroads are generally not eager to engage in shared corridor agreements with passenger operators, and therefore have stringent capital requirements as part of any shared use consideration. While freight railroads want to be good community partners, they are not willing to cross-subsidize passenger operations or place their own operations at risk for the larger public good.
- **Amtrak Involvement Brings Special Conditions.** The Rail Passenger Service Act of 1970 that created Amtrak granted the national rail passenger service carrier statutory right of access to freight railroad-owned corridors for its nationwide system. Amtrak is required only to compensate the owning freight railroads for the incremental costs associated with accommodating Amtrak-operated passenger service (intercity or commuter) over their lines. Amtrak also maintains umbrella liability agreements with the freight railroads that do not need to be renegotiated for

individual routes. These provisions give Amtrak a negotiating advantage that state and local passenger agencies do not have.

Based on our literature reviews and confirmed by our respondents, we identified common elements of the best practices of shared use corridor agreements. These include recognition that each situation is unique, the importance of trust and good-faith bargaining, the value of experienced negotiators, forward thinking, and clear, realistic goals and objectives. The following points summarize the best practices and policies in shared-use rail agreements as identified by the general respondents:

- **Capital:** The public sector must be willing to bring money to the table. A shared corridor means shared capital cost.
- **Understanding:** Both passenger and freight rail need a mutual understanding of each other's needs, but the passenger agency especially needs to be aware of railroad operation issues and norms of freight business.
- **Capacity:** Adding capacity incrementally is a good way to begin and later grow passenger service.
- **Maintenance:** The best agreements specify costs of ongoing operations and maintenance.
- **Modeling:** Use rigorous modeling such as Revenue Technology Services (RTS) to understand capacity constraints and build realistic schedules.
- **Expectations:** Approach the railroad with a clear goal, such as removing a lane of traffic from an interstate highway. Do not approach the railroads expecting the right to operate there. This attitude will cause problems.

Most often cited as specific examples of the best shared-use agreements nationally were the Capital Corridor in California, the Seattle Sounder, and the Minneapolis North Star commuter rail services. Examples of poor shared-use agreements were cited in the Los Angeles area, Chicago, Florida, and several along the Amtrak network.

Specific case studies

Boston

The case of Boston provides an example of a metropolitan area with an extensive commuter rail network that utilizes corridors formerly owned by private railroads. Today, the state of Massachusetts, through the Massachusetts Bay Transportation Authority (MBTA), owns most of the rail corridors in the Boston area, and contracts with a private company (Keolis) to operate the commuter service. Amtrak owns and operates its Northeast Corridor services from Boston to New York and operates its Downeaster service from Boston to Portland, Maine using a Pan Am Freight Railways corridor owned by Guilford Industries. The amount of freight rail traffic in the Boston area is relatively small compared to other U.S. metropolitan areas, but CSX and several short-line railroads continue to use many of the corridors to move freight through the region. Most of the shared use agreements were conducted in the 1960s-1980s period when the corridors were acquired by the MBTA. The Downeaster negotiations between Amtrak and Guilford in the 1990s and early 2000s were somewhat contentious, requiring Surface Transportation Board (STB) intervention, but agreements to reinstate passenger service were eventually reached.

There are no major changes to the current sharing agreements planned for in the near future, even though having old agreements does often require on the spot negotiations. The sharing of rail corridors is not really impacting the economic competitiveness of either party. The best practices for conducting successful track sharing all relate to cooperation, realistic expectations, and the fact that the MBTA owns most of the track. There is really very little change expected in the future in regards to track sharing currently in the Boston region. The principal take-away from the Boston case is that extensive passenger rail service can be established in shared use corridors that still support needed freight rail operations.

Chicago

The Chicago region is the largest and most complicated case of shared use rail corridors in the U.S. Six of the seven Class 1 railroads, numerous regional and short-line railroads, 13 Amtrak intercity passenger rail lines, 11 Metra commuter rail lines, and a Chicago Transit Authority (CTA) rapid rail transit system all operate in Chicago, requiring many shared use corridor agreements. Numerous configurations of operations, rolling stock ownership, track ownership, and dispatching control between and among passenger operators and freight companies can be found in Chicago.

Some of the shared use rail corridor issues raised by respondents in Chicago include capacity expansion, service performance, interlocking and grade crossings, and specific requirements for different passenger operators (Amtrak, Metra, CTA). Enhancing capacity and improving

service performance are ongoing issues in Chicago and the large number of grade crossings, including interlocking rail crossings, cause safety concerns and contribute to long delays. To address some of the most pressing concerns, the Chicago Regional Environmental and Transportation Efficiency (CREATE) project was formed as a partnership between five of the six Class I railroads, two smaller regional railroads, Amtrak, Metra, and federal, state, and local governments. The purpose was to make infrastructure improvements that would simultaneously benefit freight and passenger traffic, as well as the neighborhoods through which the lines pass. CREATE could serve as a model for public-private cooperation in addressing transportation infrastructure expansion. Because specific requirements apply to different passenger operators, the type of expanded passenger service in shared use corridors will vary. Amtrak possesses several advantages regarding rights of access, costs and liabilities over Metra and CTA, while CTA cannot initiate lighter rail transit service in active freight corridors due to safety regulations that require heavier commuter rail cars to be used.

Other issues identified in the Chicago case that have implications for best practices include the timing of cooperation, dispatching coordination, and the development of multi-organizational staff expertise. Respondents identified an unfortunate paradox that often exists in the timing of cooperation between freight railroads and passenger agencies whereby detailed planning and more accurate cost assessments do not occur until later in the process after the passenger agency has already publically divulged its intentions. This can create resentments in cases when the railroad first learns about agency plans to share corridors from newspapers or other media instead of from direct discussions. This issue was also mentioned in the Denver case study. Dispatching coordination is an issue because of the complexity of rail interactions in Chicago. A journey of a few miles can require dozens of conversations between numerous companies and agencies. Better coordination and communication among rail actors based in Chicago would greatly improve service performance there. Having staff members who had previous experience with freight railroads and/or passenger agencies helps to develop better communication and coordination between and among these organizations that should result in better outcomes.

Denver

The Denver metropolitan area is in the midst of building a 122-mile expansion of its light and commuter rail network through the FasTracks program, including the intended use of five shared corridors. While agreements were reached in four of those corridors, the Denver transit operator (RTD) was unable to conduct an agreement with BNSF to access the Northwest corridor for commuter rail service from Denver to Boulder and Longmont.

Denver also has one intercity Amtrak train (the California Zephyr) in each direction per day on its run between Chicago and San Francisco³.

Several lessons have been learned from the Denver experience with shared use rail corridors. The passenger operator needs to develop realistic cost estimates in cooperation with the freight railroads prior to the decision to build new rail lines. This will provide all parties, including the general public, with the most accurate information on which to base decisions. In the Denver case, initial cost estimates for the FasTracks plan led metropolitan area voters to believe that a 0.4% increase in regional sales taxes would be able to pay for most of the buildout. It became apparent soon after voters approved the FasTracks plan that costs were actually much higher than initial estimates (the “megaproject syndrome”). Costs for the Northwest corridor in particular roughly doubled (from \$500 million to \$1 billion) due to add-on requests from communities along the line, the need for capacity enhancements because of an increase in freight rail traffic, and new requirements to implement positive train control (PTC) along the 41-mile route. Public-private partnerships with private sector construction firms, along with federal funding, jumpstarted the other corridors, but no such partnership emerged for the Northwest rail line mainly because of concerns about the efficacy of the projected service. Most of the FasTracks program will be completed by 2018, but RTD estimates the Northwest line won’t be finished until the early 2040s. This constitutes a major breach in the commitment to voters to complete the FasTracks plan. A more realistic assessment of the costs and benefits of the Northwest rail line could have led to a reconsideration of including that line in the original FasTracks plan, thus saving RTD, BNSF, and the public from the time, resources, and turmoil associated with the commitment to complete it.

Despite the problems with the Northwest line, the Denver case revealed some more positive lessons. In the 1980s, RTD was able to acquire a corridor from a short-line railroad that no longer was using it. This corridor was later utilized for the West rail line from Denver to Lakewood in the FasTracks program. RTD acquired access to additional segments of the Gold Line from Wheat Ridge to Golden and the North Metro Line from Thornton to Erie for future expansion. Proactively acquiring access to corridors is a strategy that passenger operators should consider as part of a “corridor-banking” approach to infrastructure expansion.

Other lessons from the Denver case include the utility of packaging smaller elements (e.g., grade separations, bridges, crossings) into larger agreements, the need for staff members of

³ Amtrak also operates the Southwest Chief in southeast Colorado between Lamar, La Junta, and Trinidad on its way between Chicago and Los Angeles.

the passenger operators to understand the operations and requirements of the freight railroads, and for passenger operators and freight railroads to negotiate in good faith without airing grievances in the media.

RECOMMENDATIONS

There are several recommendations that emerge from the general analysis, as well as the case studies in this report:

1. **Understand the operations and needs of corridor owners.** Both passenger and freight rail need a mutual understanding of each other's needs, but because freight rail owns most of the corridors outside of the Northeast, the passenger agency especially needs to be aware of railroad operation issues and norms of freight business. Having staff members with previous experience from both freight rail and passenger operations will enhance understanding, communication, and cooperation. Hiring specialized experts to analyze specific elements of an agreement can be beneficial in the long run.
2. Incorporate capacity modeling analysis, realistic liability assessment, and appropriate cost-sharing approaches in shared use corridor agreements. Legislative risk of challenging the liability cap is also a major concern for freight railroads when consenting to track access. Analysis from this report confirms that these elements are among the most important, and are critical to the current and future success of shared use corridor agreements.
3. **Conduct analytical modeling in a manner that insures all issues as well as all parties are fairly considered.** It has become clear that analytical modeling prior to service changes and improvements has become a regular practice in most shared corridors. It was also recognized that these models vary significantly. While most of them are developed by the freight operators, recently the FRA also worked on the development of its own model. Regardless of who develops the model, best practices were seen in those that directly output the amount of potential service expansion the new improvement will provide for both parties.
4. **Passenger operators need to involve freight railroads early in the planning process.** Developing realistic assessments of costs and benefits in shared use corridors should be enhanced by early engagement between passenger operators and freight railroads.
5. **Explore existing categorical exclusions and express statutory exceptions in the federal environmental assessment process to allow railroads to participate earlier.** For a passenger operator such as a transit agency to receive federal funding for a project, the agency is not allowed to enter into a legal contract to purchase or

share a rail corridor until the federal environmental impact assessment (EIA) is completed. Before and during the environmental process, a passenger operator is not able to engage with interested third parties or private property owners such as the railroads, other than basic feasibility discussions. For the purpose of developing more realistic cost estimates and to establish a stronger basis for mutual cooperation, more research is warranted on the ability of passenger agencies to be allowed to work more closely with freight railroads in the specification of corridor-sharing alternatives. Agencies should seek the advice of their regional FTA offices to determine the proper process for engaging with railroads prior to NEPA.

6. **Corridor banking.** The case studies reveal the value for passenger operators to proactively acquire access, or outright ownership, of abandoned or lightly-used rail corridors before specific service plans are developed. In Boston, the state of Massachusetts was able to acquire ownership of most of the rail corridors in the region that became the basis for Metra's expanded commuter rail network while providing continued access for freight rail needs. In Denver, access to several corridors was obtained in anticipation of future passenger service. Since 2012, 49 U.S. Code 5323 allows for an agency to use corridor preservation to acquire land or right-of-way before the NEPA process as long as the corridor is not developed prior to final environmental reviews. Passenger agencies should consider having funding sources available as opportunities emerge to acquire access or ownership of rail corridors as part of a long-range planning strategy. Agencies should work closely with their federal agencies to explore these options for corridor preservation.
7. **Develop creative partnerships to address infrastructure expansion and service improvements.** The Chicago case study revealed the value of multi-organizational collaborative agreements to address pressing infrastructure needs for both freight and passenger operations. The Chicago Regional Environmental and Transportation Efficiency (CREATE) project was formed as a partnership between freight railroads, passenger operators, and the federal, state, and local governments to make infrastructure improvements that would benefit freight and passenger traffic, as well as the neighborhoods through which the lines pass. CREATE could serve as a model of public-private cooperation for other metropolitan areas in addressing both freight and passenger transportation infrastructure expansion.

ACRONYMS, ABBREVIATIONS, AND SYMBOLS

AAR	Association of American Railroads
APTA	American Public Transportation Association
ARAA	Amtrak Reform and Accountability Act
AREMA	American Railway Engineering and Maintenance-of-way Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
B&M	Boston and Maine Railroad
BNSF	Burlington Northern Santa Fe Railways
BRT	bus rapid transit
BTS	Bureau of Transportation Statistics
CDOT	Colorado Department of Transportation
CML	consolidated mail line
CN	Canadian National Railways
CNI	Chicago Northwestern Indiana
CREATE	Chicago Region Environmental and Transportation Efficiency
CTA	Chicago Transit Authority
DIA	Denver International Airport
DOT	Department of Transportation
EIA	environmental impact assessment
EIS	environmental impact statement
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
HSR	High Speed Rail
HUD	US Department of Housing and Urban Development
IEEE	Institute of Electrical and Electronic Engineers
IGA	Intergovernmental Agreement
ITE	Institute of Transportation Engineers
MBCR	Massachusetts Bay Commuter Railroad Company
MBTA	Massachusetts Bay Transportation Authority
MPH	miles per hour
NCHRP	National Cooperative Highway Research Program
NICTD	Northern Indiana Commuter Transportation District
NNEPRA	Northern New England Passenger Rail Authority
NS	Norfolk Southern
NYNH&H	New York, New Haven and Hartford Railroad

O&M	operations and maintenance
OTP	On-time performance
PC	Penn Central Railroad
PRIIA	Passenger Rail Investment and Improvement Act of 2008
PTC	Positive train control
P&W	Providence & Worcester Railroad
ROW	Right-of-way
RRIF	Railroad Rehabilitation and Improvement Financing
RTA	Regional Transportation Authority
RTS	Revenue Technology Services
RTD	Regional Transportation District
SCRRA	Southern California Regional Rail Authority
STB	Surface Transportation Board
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery grant
TRB	Transportation Research Board
UMTA	Urban Mass Transportation Administration
UP	The Union Pacific Railroad

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