Northeast Corridor Through-Ticketing Study

November 2018

Prepared by the Northeast Corridor Commission with support from:

Foursquare ITP
High Street Consulting
Mathew Coogan
RSG
WSP

CONTENTS

Glossary of Acronyms and Terms

Railroad and Transit Operator Acronyms

MBTA – Massachusetts Bay Transportation Authority

SLE – Shore Line East

MNR – Metro-North Railroad

LIRR – Long Island Rail Road

MTA – Metropolitan Transportation Authority (New York)

NYCT – New York City Transit

NJT – New Jersey Transit

SEPTA – Southeastern Pennsylvania Transportation Authority

Maryland MTA – Maryland Transit Administration

MARC – Maryland Area Regional Commuter

WMATA – Washington Metropolitan Area Transit Authority

VRE – Virginia Railway Express

Through-Ticketing and Related Terms

Through-Ticketing: A system where a traveler can purchase one ticket for a journey across more than one transportation network.

Integrated-Ticketing: A system where several transportation networks use a common ticketing or fare media system.

Joint-Ticketing: An instance when a transportation provider sells fares for other systems through its sales channels.

Third-Party Ticketing: An instance where a third-party can sell travel on a transportation system.

Other Technical Terms

GDS – Global Distribution System; Computerized system that allows third parties to make transactions (such as book a reservation) with a transportation or travel provider.

GTFS – General Transit Feed Specification; Standardized electronic format for public transportation service and geographic information such as schedules, fares, and real-time arrival information. Used by online trip planners.

Mobile Ticketing – Ticket displayed through a smartphone. Typically bar-code or visually validated by conductor.

NEC – Northeast Corridor; Rail corridor between Washington, DC and Boston, MA.

NFC – Near Field Communication; Communication protocol that enables electronic devices in close proximity to communicate with one another. NFC devices such as credit cards and smartphones used in contactless payment.

OTA – Online Travel Agency; Third party website where customers can book travel.

TVM – Ticket Vending Machine; Machine that sells and dispenses tickets.

Executive Summary

Under the 2015 Fixing America's Surface Transportation (FAST) Act, the Northeast Corridor Commission (Commission) was tasked with exploring the feasibility of expanded through-ticketing along the Northeast Corridor. Through-ticketing is any ticketing system where a traveler can pass through multiple transportation networks on their journey with one ticket. The Northeast Corridor (NEC) between Washington, D.C. and Boston, Massachusetts is a good candidate for through-ticketing due to the density of rail service offered by eight commuter railroads and Amtrak. Through-ticketing already exists in limited circumstances along the corridor.

This study explores potential models for through-ticketing with the stated goal of **improving the intercity rail and transit experience to recruit new riders and enhance the experience of existing riders.** It takes an expansive view of through-ticketing to include any integrated fare system that makes it easier to move between transit systems. The study included interviews with railroads, best practice research, and original market research to understand demand for through-ticketing and challenges in implementing it.

Models for Through-Ticketing

The study identified three potential models for through-ticketing based on a review of existing through-ticketing practices around the world. These models could be implemented with varying degrees of integration, from a simple solution that makes it easier to plan and purchase fares for an itinerary involving multiple operators, to a true single-ticket fully integrated fare. The three models are as follows:

1. **Direct-Sales Model**: NEC railroads implement through-ticketing through their existing sales channels.
2. **Third-Party Model**: NEC railroads partner with established third-party firms to implement a trip planning and through-ticketing solution.
3. **NEC-Custom Solution**: NEC railroads come together to establish a custom through-ticketing solution that would be centrally managed.

Market Demand for Through-Ticketing

In the spring and summer of 2018, the Northeast Corridor Commission conducted market research to understand the public's interest in through-ticketing. The team held focus groups in Boston, New York, Philadelphia, and Washington, D.C. with existing NEC users. A survey was later distributed to a sample of residents along the corridor who travel between NEC cities, regardless of whether they currently use rail for these trips.

The focus groups and survey were helpful tools for assessing attitudes toward through-ticketing among the public, though they were not robust enough to quantify potential additional ridership and/or revenue from new through-ticketing arrangements. The survey suggests potential for through-ticketing to influence travel

behavior and make rail and transit travel a more attractive option, including for those who currently fly, drive, or take buses between cities on the NEC. However, both the survey and focus groups suggest the public is unwilling to pay a premium for the convenience of a through-ticket over the cost of purchasing individual trips separately.

One significant finding from the focus groups was that habit and past experience have a major impact on trip mode choice. The success of through-ticketing along the NEC may lie in effective marketing of a new ticketing solution to potential new riders.

Technical Challenges Associated with Through-Ticketing

The study identified ten challenges a through-ticketing solution would need to address:

- **Customer Convenience:** How can a through-ticketing solution be most convenient for the user?
- **Trip Planning:** How will users be aware of through-ticketing opportunities and how can they go about planning such journeys?
- **Ticket Distribution and Payment:** Who is responsible for selling through-tickets and how will payment be handled?
- **Ticket Validation and Cancellation:** What kind of fare media will be issued for through-tickets? What are the logistical challenges related to validating and managing ticket reservations issued by another organization?
- **Revenue Reconciliation:** What is an equitable strategy for distributing revenue among partners? How will reconciliation be implemented to ensure an efficient and timely settlement of funds?
- **Security:** How will a solution minimize exposure to security risks, including fraud and cyberattacks?
- **Customer Service:** How will customer service issues be managed when they include multiple NEC operators? What is the chain of responsibility for handling issues?
- **Governance:** How will governance and oversight of a through-ticketing solution be structured? What steps do individual operators need to take to ensure through-ticketing is complaint with internal labor practices?
- **System Requirements:** What are the investments necessary to enable through-ticketing by individual operators?
- **Cost and Ease of Implementation:** How complicated are various through-ticketing solutions? What is the cost-benefit analysis of through-ticketing approaches?

Results and Recommendations

The study found potential market interest in implementing through-ticketing but that any solution must overcome a certain number of challenges. No technical barriers appear insurmountable, but some non-technical barriers may be more formidable (e.g., coordinating agency-specific policies, operating practices, and labor agreements). More empirical analysis would be needed to forecast the costs and benefits of significantly expanding through-ticketing. Overall the Commission has arrived at four recommendations through this study:

1. The Commission recommends voluntary improvement and expansion of the existing **Direct-Sales Model.** More specifically, future efforts should consider ways to:

- Increase the number of origin-destination pairs available for through-ticketing between partner agencies
- Increase the number of partner agencies with through-ticketing arrangements
- Address the non-technical barriers to successful through-ticketing identified in this study such as agency-specific fare policies, operating practices, and labor agreements

2. The Commission recommends other cross-agency efforts that may be prerequisite for maximizing the potential benefit of any investments in through-ticketing systems**.** These include:

   - Increasing customer awareness of potential through-travel options through marketing and improved trip planning features
   - Coordinating schedules of potential connecting services to increase the attractiveness of through travel

3. The Commission recommends monitoring current efforts to improve and expand existing **Direct-Sales Model** agreements between Amtrak and SEPTA and CTrail to gather data on the costs, benefits, challenges, and best practices of through-ticketing.

4. The Commission recommends NEC operators work to establish common standards and parameters for through-ticketing to maximize the ease of through-ticketing implementation. Such standards should make implementation easier for agencies and improve the ease of use for NEC rail customers, thereby maximizing the goal of **improving the intercity rail and transit experience in order to recruit new riders and enhance the experience of existing riders**.

1 Introduction

The Northeast Corridor (NEC) features the greatest concentration of rail and public transit ridership and service in the country. Combined, transit operators and railroads along the Northeast Corridor accounted for over half of all public transit trips taken nationwide in 2017[1]. The rail corridor between Boston, Massachusetts and Washington, DC forms the backbone of Amtrak's busiest routes and supports regional/commuter rail operations by the Massachusetts Bay Transportation Authority (MBTA) Commuter Railroad, Shore Line East (SLE) in Connecticut, Metro-North Railroad (MNR), Long Island Rail Road (LIRR), New Jersey Transit (NJT) Commuter Railroad, Southeastern Pennsylvania Transportation Authority (SEPTA) Regional Rail, the Maryland Area Regional Commuter (MARC) train service, and Virginia Railway Express (VRE). In addition to these rail operations, there are several connecting public transit systems, including five of the top ten largest transit systems in the country by ridership.

This density of service is an opportunity for greater integration between the various railroads and transit systems along the corridor. Today riders along the NEC generally must familiarize themselves with each individual system and purchase multiple fares when taking intercity trips that encompass several operators. This study looks at the potential of through-ticketing and other fare integration strategies to make it easier to travel along the corridor. As the Northeast Corridor increasingly functions as one mega-region, through-ticketing can help public transportation providers better serve the traveling needs of the public.

1.1 What is Through-Ticketing?

Through-ticketing allows travelers passing through multiple transportation networks or modes to complete their journeys on one ticket. This study also more broadly considers any solutions that coordinate fare payment or ticketing between services or modes. For example, a solution that allows users to purchase travel along the NEC through the same fare media (e.g. mobile-app or card) does not necessarily qualify as through-ticketing but would accomplish the same goal of making travel across multiple providers more seamless.

1.2 Study Background

This study originated with a congressional mandate in the most recent Federal surface transportation legislation: the 2015 Fixing America's Surface Transportation (FAST) Act. Section 11312 of the FAST Act requires that the Northeast Corridor Commission complete a study on the feasibility of through-ticketing between Amtrak service and commuter rail services along the Northeast Corridor. Language from the statute is provided below.

[1] National Transit Database, 2017 Metrics

(a) THROUGH-TICKETING STUDY.—

(1) IN GENERAL.—Not later than 3 years after the date of enactment of this Act, the Northeast Corridor Commission established under section 24905(a) of title 49, United States Code (referred to in this section as the "Commission"), in consultation with Amtrak and the commuter rail passenger transportation providers along the Northeast Corridor, shall complete a study on the feasibility of and options for permitting through-ticketing between Amtrak service and commuter rail services on the Northeast Corridor.

(2) CONTENTS.—In completing the study under paragraph (1), the Northeast Corridor Commission shall—

> *(A) examine the current state of intercity and commuter rail ticketing technologies, policies, and other relevant aspects on the Northeast Corridor;*
>
> *(B) consider and recommend technology, process, policy, or other options that would permit through-ticketing to allow intercity and commuter rail passengers to purchase, in a single transaction, travel that utilizes Amtrak and connecting commuter rail services;*
>
> *(C) consider options to expand through-ticketing to include local transit services;*
>
> *(D) summarize costs, benefits, opportunities, and impediments to developing such through-ticketing options; and*
>
> *(E) develop a proposed methodology, including cost and schedule estimates, for carrying out a pilot program on through-ticketing on the Northeast Corridor.*

(3) REPORT.—Not later than 60 days after the date the study under paragraph (1) is complete, the Commission shall submit to the Secretary, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Transportation and Infrastructure of the House of Representatives a report that includes—

> *(A) the results of the study; and*
>
> *(B) any recommendations for further action.*

1.2.1 What is the NEC Commission?

Congress established the Northeast Corridor Commission (the Commission) under the Passenger Rail Investment and Improvement Act of 2008 to promote mutual cooperation and planning among owners and operators on the Northeast Corridor (NEC) rail line and to advise Congress on corridor policy and investment needs. The Commission consists of one member from each of the NEC states and the District of Columbia; four members from Amtrak; and five members from the U.S. Department of Transportation. The Commission also includes non-voting representatives from four freight railroads, states with feeder corridors, and commuter authorities not directly represented by a Commission member.

1.2.2 Policy Goals of Through-Ticketing

The Commission considers the primary policy goal guiding this study the desire to **improve the intercity rail and transit experience in order to recruit new riders and enhance the experience of existing riders.**

Through-ticketing is seen as a strategy to achieve this goal by increasing the public's awareness of through-travel options and enhancing the purchasing of through-travel options.

The Commission also recognizes that the corridor is served by a diverse range of transit and rail operators and that any through-ticketing solution would have to preserve the existing fare and ticket pricing controls of the operating agencies or their sponsors. Moreover, through-ticketing would have to address the various fare policy differences among rail and transit providers.

1.3 Study Methodology and Organization

The Northeast Corridor Commission conducted this study over an 18-month period. The Commission convened a working group of stakeholders from several NEC commuter rail operators, Amtrak, and the US Department of Transportation with special expertise in ticketing, fare policy, and fare collection to guide the development of a scope of work, review and comment on interim deliverables, and draft findings and any recommendations for the Commission's review and consideration. The Commission also engaged a consultant team of experts in transportation market research, ticketing, and fare collection to undertake background research and technical analysis, and to support the working group in drafting findings and any recommendations.

The project started out with background research to understand the state of ticketing along the corridor, and the opportunities and challenges through-ticketing poses for NEC operators. Project staff conducted interviews with railroads along the corridor and documented any existing instances of through-ticketing.

From there, the study expanded to understand how through-ticketing is implemented across transportation sectors. International research allowed the team to begin identifying potential models for through ticketing, which were then vetted through focus groups with current rail customers and a survey of the general traveling public living along the NEC.

Finally, the team worked with NEC operators and industry experts to better understand the technical challenges of through-ticketing options. These discussions looked at a range of topics, from trip planning and ticket sales, to governance and back-end infrastructure needs.

At the end of the study, the team was able to define three feasible models for implementing through-ticketing:

1. **Direct-Sales Model**: NEC railroads are responsible for implementing through-ticketing through their existing sales channels.
2. **Third-Party Model**: NEC operators partner with established third-party firms to implement a trip planning and through-ticketing solution.
3. **NEC-Custom Solution**: NEC operators come together to establish a custom through-ticketing solution that would be centrally managed.

Within each model there are a range of through-ticketing options, from the simple (e.g. fare reciprocity agreements) to the complex (integrated trip planning and ticketing across all operators). The research findings presented in this report are framed around the three models.

1.3.1 Report Organization

The findings of this study are organized as follows:

- **State of Through-Ticketing Along the Corridor:** Review of existing ticketing practices among the railroads operating along the Northeast Corridor and major connecting transit services. Concludes with a summary of key concerns identified by these organizations at the start of the study.
- **Models for Through-Ticketing:** Explanation of the three through-ticketing models identified through this study and examples of how these models are utilized across various transportation sectors in the US and abroad.
- **Market Demand for Through-Ticketing:** Results of the focus groups and survey completed in this study to identify existing demand for through-ticketing.
- **Technical Assessment of Through-Ticketing:** Results of research on supply-side constraints to through-ticketing, including the various issues involved in implementing each of the proposed through-ticketing models.
- **Potential Through-Ticketing Pilot:** Information on how a through-ticketing proof-of-concept pilot could be scoped and implemented.
- **Results and Recommendations:** A summary of the study's results and the Commission's recommendations.

1.4 Recommendations

The study identified moderate market potential for through-ticketing along the corridor. However, unknowns related to the full cost and net benefit of advancing through-ticketing have led the Commission to recommend an incremental approach that could help set the stage for more widespread implementation. Specifically, the Commission has four key recommendations:

1. Voluntary improvement and expansion of existing **Direct-Sales Model** arrangements**.**
2. Additional cross-agency efforts to promote through-travel such as enhanced trip planning tools and schedule coordination to maximize convenience for customers.
3. Monitoring of advancements in direct sales agreements between Amtrak and SEPTA and CTrail to gather data on the costs, benefits, challenges, and best practices of through-ticketing.
4. Work to establish common parameters for through-ticketing to the degree feasible to maximize the potential ease of use for customers and collective benefit for NEC stakeholders.

2 State of Through-Ticketing Along the Corridor

Ticketing and payment systems vary widely between rail operators along the NEC today. Though NEC operators offer through-ticketing in some limited instances, there are several challenges that would need to be overcome to extend the practice throughout the entire corridor. As part of this study, the research team collected publicly available information and conducted interviews with agencies that operate on the NEC to better understand their existing ticketing practices, plans for future fare payment systems, and overall interest in expanding through-ticketing practices in their service areas and beyond. The following sections summarize current practices and challenges.

2.1 Fare Payment Systems on the NEC

2.1.1 Existing Fare Payment Systems

The most common types of fare media are paper tickets, value-stored cards (e.g., MTA's MetroCard, MBTA's Charlie Card), and most recently, mobile payment. MTA LIRR, MTA MNR, MBTA, NJT, Amtrak, and Virginia Railway Express (VRE) all accept mobile tickets on commuter or intercity trains. SEPTA, in partnership with Mozio, had a now-discontinued mobile app ticketing pilot on the Regional Rail's Airport Line.

The transit industry is trending toward adopting contactless open-payment technology that will allow riders to use bank cards and mobile phones in addition to transit-agency-issued fare media for payment. SEPTA is the only agency with a payment platform that is compatible with Near Field Communication (NFC) open-payment (e.g., Apple Pay®, Google Pay™) systems, yet most other agencies along the corridor are either considering or currently implementing such a system.

2.1.2 Planned Upgrades to Fare Payment Systems

Most major transit providers along the NEC are in the process of overhauling and updating their fare payment systems. Some highlights of planned improvements include the following:

- **SEPTA** is currently rolling out a next-generation fare payment system called SEPTA Key that it designed to be compatible with contactless payments systems. The system will be implemented across all modes by the end of 2018.
- **MTA MNR, MTA LIRR,** and **MBTA** have recently contracted with Cubic Transportation Systems and are in the early stages of planning new fare payment systems, with upgrades happening over the next two to six years. These systems would be compatible with other contactless payment platforms such as Apple Pay®, contactless bank cards, and contactless transit cards. These systems will merge subway, bus, and rail into one integrated form of payment.
- **NJT** has recently contracted with Conduent Transportation Solutions and is in the early stages of planning account based open fare payment systems, with upgrades happening over the next five years. These systems

would be compatible with other contactless payment platforms such as Apple Pay®, Google Pay™, contactless bank cards, and contactless transit cards.

- **CTtransit** is exploring options for a next-generation fare payment system but no final strategy has been identified. CTrail is developing a mobile ticketing application for the Hartford Line that will be compatible with Amtrak's handheld barcode readers.
- **Amtrak** recently began accepting Apple Pay®. This will enable customers to more easily pay using the Amtrak app. Amtrak is focused on making it as easy as possible for the passenger to purchase what they need in one place.

Table 1: Overview of Fare Payment of Select NEC Agencies

Agency	Open Contactless Payment	Mobile Payment	Ticketing Partners	Major Future Developments
MTA LIRR/MNR	--	Yes	CTtransit and multiple private operators	--
MTA NYC Transit	In development	--	--	New open account-based payment system; contract with Cubic has been signed in late 2017
SEPTA	Yes	Limited (airport line only)	NJT, Amtrak	Implementation of open account-based payment and deployment of SEPTA Key Fare Program on Regional Rail in 2018
MBTA	In development	Commuter rail only	--	New account-based open-payment system to be launched in 2020
CTtransit	--	--	MNR	Exploring options for future payment options
NJT	In development	Yes	SEPTA, NY Waterways, Amtrak	Adopting new account-based open payment system. Contract signed with Conduent in early 2017.
Amtrak	--	Yes	SEPTA, Maryland Area Regional Commuter (MARC), NJT, 40+ intercity bus companies	Amtrak plans for integrated ticketing with selected transit agencies
MARC	--	To launch in the second half of 2018	Amtrak	--
WMATA	--	--	--	Agency has plans for a next-generation payment system
VRE	--	Yes	Amtrak	--

2.2 Current Through-Ticketing Arrangements

The most common form of through-ticketing in the NEC is between commuter railroads and private bus operators or local subway/bus service, most notably in the New York metropolitan area. A few commuter railroads and Amtrak maintain some degree of reciprocal access for monthly pass holders. Amtrak also has some limited through-ticketing on SEPTA and NJT commuter trains as well as a codeshare agreement with United Airlines out of Newark Airport. In addition, a few commuter railroads sell joint-tickets. While some commuter railroads have the capability to sell tickets for other transportation providers (e.g., for private buses

that feed MTA MNR), only a couple of agencies accept tickets purchased from another transit provider (e.g., SEPTA Regional Rail allows NJT to sell its tickets). The following sub-sections summarize examples of current through-ticketing practices along the NEC.

Amtrak

Amtrak maintains through-ticketing and cross-honoring agreements across the country, including agreements with intercity bus operators, United Airlines, and commuter railroads. Within the NEC, commuter rail pass holders on MARC and Shore Line East can ride on certain Amtrak trains. Amtrak also accepts CTrail tickets between Springfield, MA and New Haven, CT. This practice was more widespread when Amtrak operated the Clocker service between New York City and Philadelphia that accepted both Amtrak and NJT ticket holders; NJT would reimburse Amtrak based on customer counts. Amtrak ticket holders can ride SEPTA Regional Rail between 30th Street Station and other Center City stations by showing their ticket stub to the conductor. Amtrak tickets are also acceptable at NJT fare gates between Newark Liberty International Airport rail station and the AirTrain to or from airport terminals.

The only two examples of real through-ticketing with Amtrak along the NEC are agreements with United Airlines and NJT. United Airlines and Amtrak have a codeshare agreement on flights leaving from Newark Liberty International Airport and select NEC stations such as Philadelphia 30th Street. With NJT, Amtrak sells through-tickets to Atlantic City with a transfer in Philadelphia to NJT's Atlantic City Line.

Amtrak believes their customers would benefit from expansion of through-ticketing opportunities. Amtrak survey data suggest significant shares of their customers at major stations are connecting to commuter rail or other local transit modes. Table 2 shows access and egress shares between Amtrak and commuter rail services. Table 3 shows even greater shares of customers connecting to other local transit modes.

Table 2 Commuter Rail Connections - Amtrak Passenger Surveys

	Departing from Origin	Arriving to Destination
Philadelphia, PA	17%	15%
New York, NY	11%	8%
Boston, MA - South Station	7%	4%
Washington, DC	1%	1%

Table 3 All Transit Modes Connections - Amtrak Passenger Surveys

	Departing from Origin	Arriving to Destination
New York, NY	39%	29%
Boston, MA - South Station	31%	26%
Boston, MA - North Station	35%	36%
Washington, DC	25%	24%
Philadelphia, PA	25%	18%
Boston Back Bay, MA	22%	18%
Newark, NJ	18%	15%
New Haven, CT	9%	9%
Baltimore, MD	6%	6%
Providence, RI	4%	3%
Wilmington, DE	2%	2%

SEPTA

SEPTA and NJT maintain an arrangement that allows riders transferring through Trenton Transit Center to purchase a joint one-way or round-trip fare. The ticket prices are the same as the combined cost of an NJT and SEPTA ticket, but these passes save riders the trouble of purchasing a second ticket at Trenton when transferring between providers. NJT sells these tickets from all rail Ticket Vending Machines (TVMs) and from the ticket office (using Ticket Office Machines), while SEPTA sells tickets from its ticket offices at Center City stations.

As mentioned above, SEPTA allows same-day Amtrak ticket holders to ride Regional Rail between its other Center City stations and 30th Street Station. These tickets are currently validated through a simple visual inspection by conductors. SEPTA, as part of its rollout of SEPTA Key, is installing fare gates at its major downtown rail stations. To accommodate existing and future through-ticketing agreements, certain gates at each station are equipped with a barcode reader.

MTA LIRR and MTA MNR

MTA LIRR and MTA MNR both operate (separately) a program called UniTicket, which sells joint-tickets and passes with connecting bus operators. Today, MTA MNR has 20 operating partners and MTA LIRR has 4. The UniTicket offers passholders a discount on the combined cost of two separate weekly or monthly passes. The tickets are sold exclusively by the railroad. In addition to the UniTicket, MNR has a similar UniRail program with Shore Line East commuter railroad and an agreement to sell through-tickets on NJT during football games at the Meadowlands.

NJT

In addition to the through-ticketing arrangements described above with SEPTA (Trenton Line/Northeast Corridor Line) and Amtrak (Atlantic City Line), NJT has through-ticketing agreements with New York Waterway for ferry service to Manhattan, Port Authority for travel on the AirTrain Newark, and MTA MNR for train service to MNR and NJT rail stations. The New York Waterway arrangement allows riders to purchase one ticket for bus/light rail and connecting ferry service to Manhattan. The Port Authority agreement means the cost of riding AirTrain to or from Newark airport terminals and the airport rail station is included in the price of rail tickets. The Train to the Game program with MTA allows for the sale of through-tickets on MNR/NJT and LIRR/NJT to the Meadowlands during football games.

2.2.1 Through-Ticketing Discounts

A few agencies along the corridor provide discounts on through- or joint-tickets. MNR gives customers a two percent discount on the combined cost of an MNR and New York City Transit (NYCT) monthly pass when purchased together. Similarly, MNR and LIRR provide discounts to customers purchasing a UniTicket over the combined cost of two separate passes. For a small monthly reimbursement from Amtrak, SEPTA allows Amtrak ticket holders to ride free between 30th Street Station and other Center City Regional Rail stations.

2.3 Potential Challenges

Through-ticketing is already employed on a limited basis on the NEC between Amtrak, commuter railroads, local transit providers, and airlines. There are, however, several challenges to broader cooperation in ticketing along the corridor, none of which are insurmountable with funding and political/institutional support. These challenges are summarized below and discussed in more detail in Chapter 5: **Technical Assessment of Through-Ticketing.** Some common concerns raised by agencies, include:

- Lack of a compatible or unified method of ticketing
- No travel portal to plan and book integrated itineraries
- Lack of schedule coordination among agencies (e.g., potential connecting train leaving too early/too late)
- No established process for pricing, sales, and revenue reconciliation
- Potential cost or negative revenue impacts
- Impact on existing operating practices and labor agreements, including work rules that only permit agency employees to sell fares
- Unclear whether benefit of through-ticketing warrants the cost
- Benefits may not be equitably distributed among NEC operators

3 Models for Through-Ticketing

In order to understand existing practices and possible options for through-ticketing for the Northeast Corridor, the project team conducted an extensive search for relevant instances of coordination and integration between transportation agencies. Interviews with industry experts and a literature review uncovered examples across the US, Europe, and Asia that offer lessons for this study.

The team's research identified three basic models for implementing through-ticketing. The key difference between the three models is who is responsible for marketing and selling through-ticket itineraries. In the **Direct-Sales Model**, through-ticketing would be conducted by the individual transit and rail providers along the corridor. They would be responsible for providing any necessary information about connecting services and selling fare products that enable through-ticketing. In the **Third-Party Model**, an outside partner would provide customers a resource to plan and purchase through-ticket itineraries. The **NEC-Custom Solution** would create a new service jointly managed by NEC operators to provide through-trip planning and through-ticket sales.

These three models are illustrated in several examples from around the world. Within each model there are a range of different strategies to accomplish more seamless travel across systems, from simply providing better customer information on connecting services to complex fully-integrated through-ticketing programs.

3.1 Through-Ticketing Option 1: Direct-Sales Model

Under this option, one or more NEC agencies would be able to sell tickets for other NEC agencies' services. Any commission fees would be for the purpose of covering the marginal administrative cost of providing this option. The intention of this option is to attract new customers to intercity rail and transit, particularly those currently using other modes. A full integration version of this option would be the use of combined integrated tickets, which would likely have a bar code that would be recognized by multiple or all NEC agencies. Another variation of this option would be for agencies to sell tickets for other agencies' services, but in a less integrated manner; for example, by selling a day pass on another agency's system at the same time an intercity rail ticket is sold.

Direct-sales of through ticketing is a model already used by some NEC operators and could be implemented in an incremental manner. While not insurmountable, challenges associated with this option could include potential conflicting business rules and special pricing policies, costs to some agencies for implementing ticket validation, potential complications from missed connections between systems, possible additional costs to the consumer, and the potential for agencies to lose customer accounts to other issuing agencies.

There are several components and options, as well as informative examples, for the type of solutions that could be considered direct sales between agencies, as described in more detail below.

3.1.1 Basic Information Sharing and Service Coordination

The most basic strategy in this model is better coordination between connecting transportation systems, including schedule and fare information. In **Germany, Deutsche Bahn** (DB), the national rail operator, offers a trip planning service that allows customers to purchase online tickets for segments operated by DB and its partner rail and transit agencies. The trip planner allows a rider to book a trip that might include an intercity rail segment, a trip on the local rail/subway system, and a ride on a local bus.

In the Northeast Corridor, transit providers could assist riders who transfer between systems by providing more information on one another's fares and schedules, even without the option to purchase integrated tickets. Schedule adjustments to minimize wait times when transferring could also make such trips more convenient for customers.

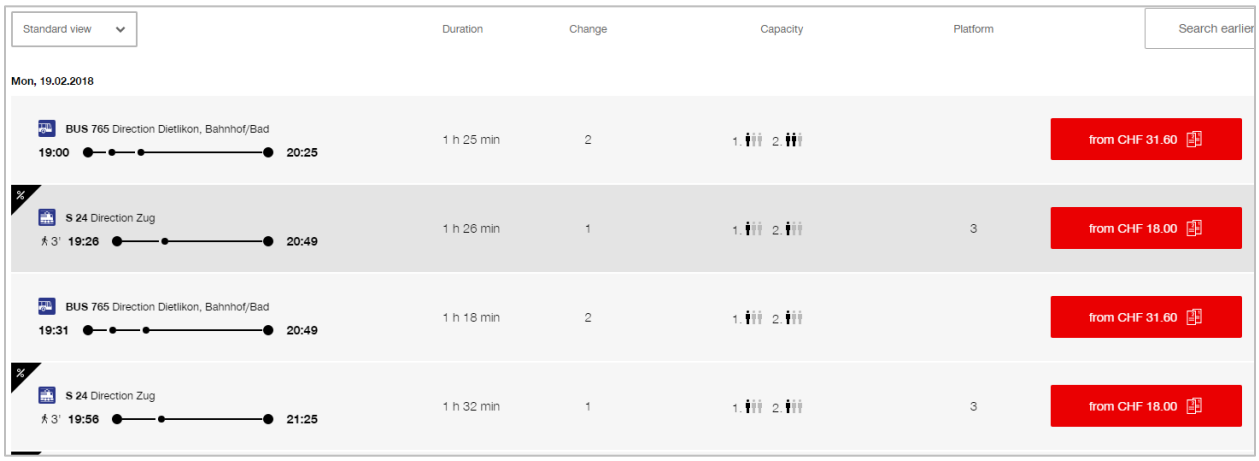
3.1.2 Ticket Cross-Honoring

Cross-honoring is the practice of accepting other carrier tickets for travel. **In California, the Rail 2 Rail program** allows holders of monthly passes on certain corridors of Metrolink (commuter rail service in the Los Angeles area) or Coaster (which serves the San Diego area) and Amtrak Pacific Surfliner ticketholders to ride on any participating operator's train between the stations on their pass or ticket. Coaster and Metrolink have negotiated a per-passenger reimbursement agreement with Amtrak, with a cap on total annual reimbursement, which changes from year to year.

3.1.3 Special Fare Products Such as Day Passes for Intercity Travelers

Some arrangements, which could also be considered for the NEC, allow for purchasers of intercity rail tickets to also add-on day passes for local transit to their ticket. In **Switzerland,** customers who purchase long-distance tickets on the **national railway system (SBB)** can purchase a single ticket that includes the local transit portion of the journey by adding a day-pass ticket for local transit to the cost of the intercity portion of the trip. However, the day-pass ticket costs significantly more than the combined cost of one or two single journeys on the local transit system, so the day-pass addition to an itinerary only makes sense for riders who plan to use transit multiple times on the date of their arrival at their destination, or those who want to avoid the hassle of buying another local ticket upon completion of the intercity portion of their journey.

Figure 1: Example of Itinerary Between Zurich Suburb and Luzern



In **Germany**, holders of a **DB BahnCard**, who pay a monthly subscription fee, are entitled to free travel on connecting local transportation services with the purchase of a DB ticket (as well as a discount on the DB ticket itself). In the **UK** many train operators also sell day passes for local transportation. Like in Switzerland, these passes permit unlimited travel on transit services during the day of travel. Two kinds of passes exist: PlusBus for participating transit operators outside of Greater London and the London Day Pass for travel within London. PlusBus passes do not have a large price discrepancy over the cost of a single local transit fare; however, London Day Passes cost roughly $16.50, making it significantly costlier than a single-journey ticket.

3.1.4 Joint Ticketing

Joint ticketing is an arrangement in which a transportation system can sell fares for travel on another system; typically such arrangements work in a reciprocal fashion. For example, **SEPTA in the Philadelphia region and New Jersey Transit (NJT)** have a joint ticketing arrangement whereby riders transferring through the Trenton Transit Center can purchase joint one-way, round trip, or monthly interagency passes. The ticket prices are the same as the combined costs of NJT and SEPTA tickets, but save riders the trouble of having to purchase a second ticket when transferring between systems. In another example, **VIA, Canada's national railway company**, allows users of its website to purchase tickets for trips on the commuter and regional rail systems in Toronto and Montreal, including trips that do not include a segment on VIA trains. In both models, revenue is reconciled between the seller and operating agency.

3.1.5 Codesharing and Joint Ventures

Codesharing is an arrangement in which two or more transportation providers publish and market the same service under their own brand and timetable. While the tickets on the service can be purchased through either operator, the service is operated by one company. Joint-ventures take codesharing a step further, as the participating transportation providers coordinate schedules and share revenue and costs across their services. **VIA in Canada** and **Amtrak** have a long-standing joint venture on the Maple Leaf route between New York City and Toronto. The route is operated by VIA from the U.S.-Canada border to Toronto using Amtrak equipment. Amtrak sells tickets for any itinerary that includes a station within the US; VIA sells tickets for trips that include a station in Canada.

In Germany, a service called **AIRail** demonstrates a high level of integration between rail operators and airlines in Europe. The service allows participating airlines to book passengers on itineraries through Frankfurt Airport to Cologne and Stuttgart by rail. The airline buys a block of tickets on selected trains and sells them as airplane tickets. Lufthansa passengers are given separate compartments; first class air passengers are offered drinks and snacks, while economy passengers are given a voucher to use at the bar car. The ticket is sold as a product for which the airline assumes branding and bears responsibility consistent with the rules of an International Air Transport Association (IATA) ticket. In addition, several airlines in Europe sell rail tickets to passengers to their final destination. **Swiss International Airlines**, for example, allows passengers to book an onward connection by train from its Zurich hub to Basel, sometimes at no additional cost. The flight ticket barcode serves as the train ticket.

3.2 Through-Ticketing Option 2: Third-Party Model

Under this option, a third-party will be responsible for facilitating through-ticketing. There are various degrees of service integration possible in this model, ranging from the third-party simply providing trip planning and

service information for systems along the corridor, to a service that sells through-tickets through a single transaction.

A benefit to this option is that it could potentially access new customer markets through partnerships with private sector vendors, such as Google Maps, who might also be willing to shoulder some of the initial implementation cost. Existing trip planning and travel reservation platforms already have an established user base that is familiar with the service.

3.2.1 Trip Planning Clearinghouse

One option for third-party sales could be an agreement between the third-party and rail service providers for the use of the third-party's platform that provides a clearinghouse for fare information and trip planning. In a "low integration" example of this option, the third-party would directs users to the providers' website(s) or mobile application(s) to purchase tickets directly from the provider(s); however, it would also be possible for this third-party to directly sell tickets as well. **Google Maps** and other websites, as well as mobile applications such as **City Mapper**, already offer this type of trip planning service. Google Maps also already provides links to the provider's website, at least in some cases, to get more information or to book tickets; however, Google Maps does not currently auto-populate fields on Amtrak's website with the information entered into its trip planning feature. **In Japan, Hyperdia** website and mobile app provides trip planning and fare information, including for complicated multi-operator journeys. Hyperdia includes options to limit the search to users of particular fare products, like the Japan Rail Pass. It makes multi-system itineraries easy by providing information such as arrival and departure platforms.

3.2.2 Single Point of Sale for Multi-Agency Itinerary

Another option for third-party sales is for a private company to be involved in trip planning and the direct sale of rail tickets, similar to the way vendors such as Travelocity and Priceline sell flight tickets. **In the U.K.,** private rail fare retailers such as **Trainline and Train Genius** provide through-ticketing by offering customers integrated ticketing options across modes and operators. Tickets can be sent by mail, printed out at home, or retrieved from TVMs in the same manner as tickets bought directly from the train operator. Third-party services can cost more than directly purchasing tickets from train operators, but these services offer users innovative features such as simple interfaces, predictive pricing tools, and real-time travel updates. In this particular case, Trainline and other private services are free to aggressively market their services to potential customers; to the extent this marketing is successful, it generally benefits both the third-party as well as the rail agency.

3.2.3 Integration with Common Payment Platforms

While not a true example of through-ticketing, the implementation of contactless payment technologies such as ApplePay®, which rely on Near Field Communication (NFC) chips, has the potential to offer passengers a means to avoid purchasing farecards, potentially across multiple providers' systems, should they choose to implement compatible technologies or to adhere to one universal payment standard. As described above, some NEC agencies are already implementing, or exploring the possibility of implementing, technologies that allow for payment via NFC chip technology.

3.3 Through-Ticketing Option 3: NEC-Custom Solution

Under this option, the NEC and its member agencies would work together to establish and implement a custom NEC solution for through-ticketing. This solution could include a website and application with point-to-point,

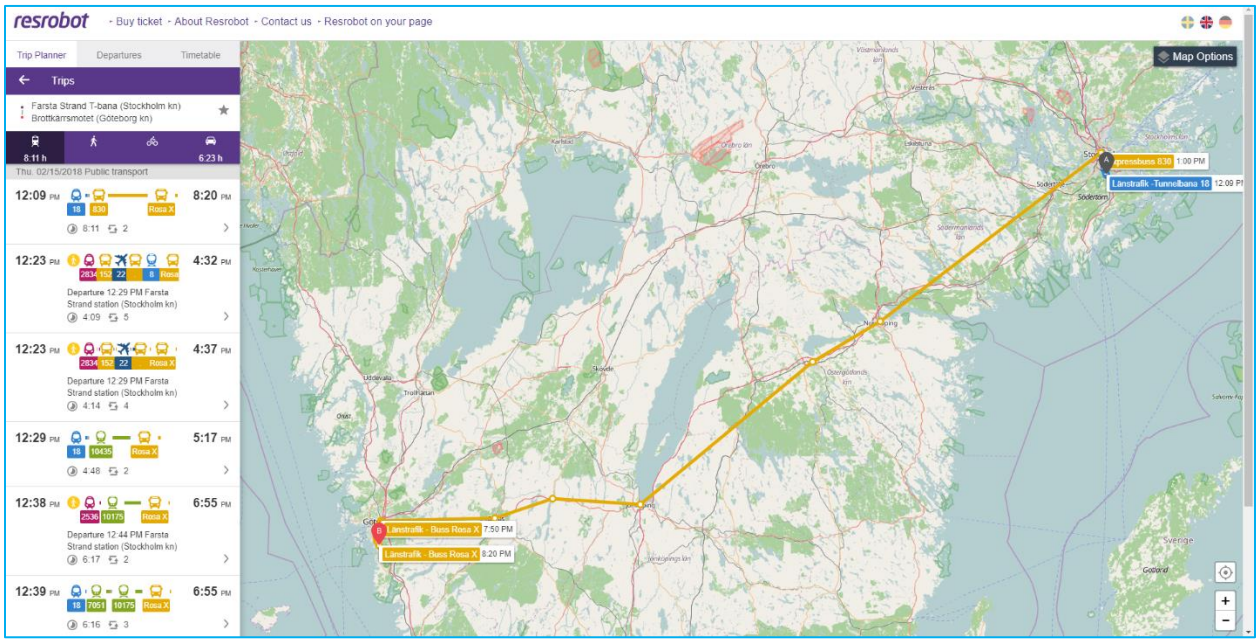
integrated trip planning and ticket sales capability. A custom solution would enable seamless trip planning and ticket purchases across all NEC agencies, and would likely require an interagency group to run implementation, possibly with the assistance of a contractor and/or vendor.

3.3.1 NEC-Branded Trip Planning Clearinghouse

NEC agencies could start by developing a corridor-wide trip planner, similar to the tools discussed under option 2. A good example of this is **Network Rail** in the U.K.. Network Rail is a public organization that oversees the U.K.'s multiple train operators. It provides multimodal trip planning services through its website; however, it does not sell tickets but instead forwards users to a ticket retailer, which is typically the railway operator responsible for the longest-distance segment in the itinerary, to make the purchase. In a single transaction, riders can then buy an itinerary that includes services provided by multiple operators.

In **Sweden, ResRobot** is the national trip planning service. ResRobot was created by an alliance of local and national transportation carriers called Samtrafiken. ResRobot provides itineraries for all modes, including auto and air. ResRobot allows users to purchase on-site integrated tickets for intercity trains, local rapid transit, and local bus. Unlike other similar tools, ResRobot will include multimodal itineraries, such as driving directions to a transit park-and-ride, and recommends taxis when adequate local transit is not available.

Figure 2 : Screenshot of Sweden's ResRobot Trip Planner.



3.3.2 Integrated Fare Payment (Application-Based or a Standardized Fare Media)

Another option would be to create an integrated fare payment method that allows the user to travel through the system using the same fare media, such as a mobile app or fare card. This could work similar to the **Oyster Card in Greater London**, which is a contactless payment card issued by Transport for London and can be used on local bus, Underground (subway), tram, and rail service. Because fares differ by station pair, this has required the installation of fare card readers at all stations, and riders taking multi-segment trips must tap in and tap out with their Oyster card after each trip segment. The back-end Oyster system registers each trip segment and charges the user the appropriate combined fare automatically at the end of his or her journey. For example,

an Oyster rider transferring from a National Rail service to Underground will pay a final fare that reflects any joint-ticketing discounts. Transport for London plans to implement fare payment compatibility with contactless bankcards as well. One challenge associated with fare payment that is compatible with contactless bankcards is that it may result in less data being provided to operating agencies.

In **the Netherlands, the OV-chipkaart** is a contactless card that can be used for payment on all public mode trips, whether long-distance or short-distance. The OV-chipkaart was developed by the metropolitan Rotterdam transit agency and was adopted thereafter by Amsterdam and the national rail services. With the exception of e-tickets by mobile app, the OV-chipkaart is the sole payment system on the national rail service, as a disposable form of the card has fully replaced single trip paper tickets.

Despite these successful examples, it is important to note that this option would likely be costly, as it would require some level of consistency across technologies, new and old, currently in service or being implemented by NEC operators. It would also require intensive coordination, revenue reconciliation, website collaboration, and policy alignment.

Figure 3: OV-chipkaart (photo by Moeerd / CC BY SA 3.0)

3.4 Variations in Integration Under Each Option

Each of these options (direct-sales, third-party, or NEC-custom solution) is possible to pursue at varying levels of integration. Each has potential approaches that feature lower levels of coordination and institutional complexity. Opportunities to more fully integrate tickets across agencies may benefit or attract more customers; however, these approaches require greater levels of coordination and would be more expensive and complex to implement institutionally. Issues such as pricing policy, revenue reconciliation, etc. would need to be agreed upon by all agencies participating in such arrangements.

Varying levels of integration applies to multiple aspects of each through-ticketing solution. For example, in terms of ticket purchasing and pricing, a moderate integration solution – regardless of which option is chosen – would involve each agency still selling tickets for its own services directly (i.e. separate transactions), but with the purchase and trip planning process being more convenient and seamless. A highly/fully integrated solution would likely involve a universal barcode, whether paper or mobile, that would be recognized universally by all agencies whose services are part of the traveler's itinerary.

4 Market Demand for Through-Ticketing

In the spring and summer of 2018, the Northeast Corridor Commission conducted market research to understand the public's interest in through-ticketing. The team held focus groups in Boston, New York, Philadelphia, and Washington, D.C. with existing NEC users. A survey was later distributed to a sample of residents along the corridor who travel between NEC cities, regardless of whether they currently use rail for these trips. The focus groups and survey were helpful tools for assessing attitudes toward through-ticketing among the public, though they were not robust enough to quantify potential additional ridership and/or revenue from new through-ticketing arrangements. To better understand potential impacts on ridership and revenue, additional data collection and analysis is required.

4.1 Overview of Methodology

4.1.1 Focus Groups

Focus groups allowed the project team to ask in-depth and probing questions to understand travelers' reactions, as well as the thought processes behind those reactions, to different potential ticketing options. Focus groups helped the project team understand which options would appeal more to travelers and why. Specifically, the focus groups were used to answer the following questions:

- Is there interest in through-ticketing?
- What is the decision process for customers' mode choices, and how do they plan their trips?
- What information sources do customers use for trip planning?
- Will there be changes in travel behavior, mode choice, or frequency of travel if through-ticketing were available?
- How strong is customers' willingness, if any, to pay for through-ticketing?
- Is there perceived convenience of through-ticketing compared to buying single tickets?
- What are the desired features of through-ticketing?
- What is the perceived importance of through-ticketing relative to other offerings and improvements?
- How do travelers react to different through-ticketing options?

A total of 41 people participated in four focus groups, which were held in May 2018 in four cities: Boston (12 participants), New York (11 participants), Philadelphia (8 participants), and Washington, DC (10 participants). Participants were primarily recruited in person through intercepts at the main rail stations in each of these four cities. In order to ensure diversity in the perspectives and travel habits of focus group participants, a few participants were also recruited via email lists from a previous Commission study. A screening questionnaire was used for both the intercept and email recruitment.

Each focus group followed a similar format, beginning with an ice-breaker question asked of each participant ("How do you travel along the Northeast Corridor?"). Throughout the interactive and dynamic discussions, questions about how people plan their travel were asked, as well as both prompted and unprompted questions about perceived benefits about through-ticketing. Eventually, specific options for through-ticketing were presented to the participants, and their reactions, which are described in detail below, were observed.

4.1.2 Survey

In order to gather input from people who live along the Northeast Corridor regarding their interest in through-ticketing, the project team conducted a survey covering four metropolitan areas: Boston, New York, Philadelphia, and Washington, D.C. Respondents must have made at least one intercity trip to one of the three other metropolitan areas via any mode in the prior year. Participants were recruited through a purchased sample to whom survey invitations were sent. A screening question ensured that respondents to the survey met the eligibility requirements. Specifically, respondents had to be 18 years or older, live in the larger metropolitan areas of one of the four NEC cities (Boston, New York, Philadelphia, or Washington, D.C.), and must have made at least one trip to one of the other three cities or surrounding suburbs within the last year.

The survey asked a variety of primarily multiple-choice questions, some of which were conditional (i.e., based on answers the participants provided to previous questions). For questions related to travel to other cities along the NEC, topics included: frequency of trips and mode(s) of travel, frequency of transit use upon arrival, trip purposes, number of travelers and bags, process of planning the trip and tools used, mode selection process and reasoning, method of ticket purchase, opinions on the desirability and intuitiveness of transit in the visited city, and familiarity with and interest in an Amtrak/Lyft partnership. The survey also asked questions about participants' interest in different through-ticketing options, including how helpful it would be, what the concerns would be, willingness to pay extra for an integrated ticket and easier travel experience, whether through-ticketing would increase interest in taking rail in the future, and the most important feature(s) of a through-ticketing option. The survey also asked questions related to the participant's use of transit in his or her home city, as well as demographic questions related to home location, age, race, gender, education, and income.

4.2 Focus Group Findings

The focus groups yielded several findings that informed the project team's understanding of attitudes toward through-ticketing. Overall, there was interest in through-ticketing. Key findings regarding participants' habits and thought processes that have implications for through-ticketing are highlighted below.

4.2.1 Emphasis on Convenience

Infrequent travelers appear to value convenience. Participants indicated that they will use mobile applications like Uber or Lyft even in instances where local transit is a competitive and more affordable option, largely due to these apps' greater convenience. However, some participants also cited concerns and limitations with purchasing tickets through an app, as some print their Amtrak ticket at a kiosk, preferring not to worry about the battery life of their cell phone. Other participants relayed similar anxieties of traveling with dwindling battery life. In discussions about app adoption, a generation divide was apparent. Among younger participants, downloading or using an additional app did not pose any concerns. Older participants seemed to prefer a physical ticket option, traveling with a card or a printed ticket. Overall, participants expressed reluctance to download new apps if they will not use the apps frequently in the future.

4.2.2 Lack of Knowledge about Transit in Other Cities

Many participants indicated that their familiarity with transit systems outside of their home city/metro area was low, and that this was a factor that heavily influenced their lack of inclination to use transit upon arrival in their destination cities. This finding indicates that any through-ticketing solution should lower the barrier of using transit at the destination city, which could be achieved by offering an easy-to-use trip planner that includes transit at the destination city or by making fare payment easy (e.g., one-day pass at the destination city). For instance, participants in New York City discussed confusion around Washington D.C.'s metro system, in which fares are determined by distance traveled, unlike the flat fare of $2.75 in New York City. A transit day pass added to the itinerary of Washington, D.C.-bound trips may entice visitors with an interest in exploring the city who otherwise may have been discouraged by the unfamiliar metro fare structure.

4.2.3 Planning Based on Routine

Many people, when asked about their trip planning methods and how they select their intercity travel mode, indicated that routines and habits were the most significant factor in their mode and route choices. For example, responses such as "for a trip to New York, I just use Amtrak and book on their website" or "I go to Google to do all my trip planning" were common. Some participants mentioned taking a different approach for trips taken for business versus personal trips. In some cases, participants do not have flexibility to influence travel plans for work trips. Unsurprisingly, many also indicated that they are less price sensitive when their company purchases the tickets. For personal trips, they cited spending more time comparing fares and the travel options offered.

4.2.4 Perceived Shortcomings of Through-Ticketing

Despite the positivity about through-ticketing options, focus group participants did not express a high tolerance for paying more for a through-ticket compared to what they currently pay for tickets along the NEC. Participants relayed their positive experiences using through-ticketing in Europe and Japan but citied concerns about the feasibility of widespread adoption among travel providers in the United States. New York City participants, for example, expressed doubts that the NYC MTA could integrate the required technology at each subway stop if local transit through-tickets were pursued. Those who expressed skepticism or limited interest in through-ticketing generally were either people who rarely or never take transit (and thus would hardly be affected by through-ticketing) or those who did not perceive through-ticketing to have a significant impact on the ease of travel (presumably vis-à-vis other improvements such as reducing delays). One participant expressed a preference for the status quo over an integrated system that would increase travel costs.

4.3 Survey Findings

The project team obtained 822 completed survey responses, with nearly equal participation from residents of all four metro areas. The mode of the reference trip (i.e. criterion used to screen only respondents that had traveled along the NEC) was 48 percent auto, 27 percent train (Amtrak), 14 percent air, 8 percent bus, and 3 percent SEPTA/NJT (i.e. intercity travel between the Philadelphia area and the New York/New Jersey area using only commuter rail). It is important to note that these percentages are not representative of all travel along the NEC, as Amtrak riders were oversampled. The respondents tended to be more affluent, with just over half having household incomes over $100,000 (see Table 2 for details). The female/male breakdown of respondents was 57 percent to 43 percent.

Table 4: Survey Participants by Household Income

Household Income	Percentage of all Survey Participants
Less than $25,000	4%
$25,000 to $49,999	9%
$50,000 to $74,999	16%
$75,000 to $99,999	21%
$100,000 to $199,999	37%
$200,000 or higher	14%

4.3.1 Positivity Regarding Through-Ticketing

Overall, the responses indicated that attitudes toward through-ticketing among the participants were positive, with more than half (54 percent) of the respondents who used Amtrak to travel, but did not use transit upon arrival, indicating that through-ticketing would make them more likely to take transit (commuter rail, subway, or bus) from the train station to their final destination. Current non-Amtrak users were generally positive about through-ticketing as well, with 48 percent indicating that through-ticketing would make them more likely to incorporate some type of public transportation into their itinerary. Thirty-one percent of non-rail users indicated that they would consider making their trip with Amtrak instead of other modes if through-ticketing was available.

4.3.2 Concerns about Cost

While overall responses to through-ticketing were positive and indicated an aggregate likelihood of more train and transit usage with a through-ticketing solution, only 21 percent indicated that they would be willing to pay additional fees for the convenience of a through-ticketing service vis-à-vis current ticketing options. By comparison, 68 percent of all respondents indicated that they would be interested in a through-ticketing solution if it offered a discounted price. When asked about the single most important attribute of through-ticketing, 26 percent of respondents indicated "no additional cost"; this was the most common response, with "has trip planner" (21 percent), "one app covers the entire NEC" (about 17 percent), and "has mobile ticketing option" (10 percent) being the next most frequent responses. About 45 percent of respondents indicated that they were concerned about whether they would be granted refunds in the event of missed trains/delays.

4.4 Key Findings and Conclusion

The focus groups and survey were both helpful tools for assessing attitudes toward through-ticketing among the public. The survey was most helpful for illuminating the potential, which seems to be significant, for through-ticketing to influence travel behavior and make rail and transit travel a more attractive option, including for those who currently fly, drive, or take buses between cities on the NEC. Both the survey and the focus groups were consistent in illuminating people's willingness to pay higher fares for a through-ticketing solution, which seems to be relatively low. The focus groups were most helpful at identifying people's habits with respect to trip planning and making travel mode decisions. The reality that most focus group participants seemed to make their travel plans based on past experience and habit indicates that the success of a through-ticketing

solution to increase rail ridership and transit usage along the NEC may lie in effective marketing of a new ticketing solution to potential new riders.

Limitations associated with these research methods include a somewhat modest sample size (of just over 200 people per metro area for the survey and only about 10 people per metro area for the focus groups) and the risk of bias in those who provided survey responses. In addition, stated preferences (how people say they will behave) are not always consistent with revealed preferences (how they actually behave when a situation arises), so one cannot necessarily assume that people will behave in the ways they indicate in response to a survey or focus group question. To better understand market interest in through-ticketing, particularly potential impacts on ridership and revenue, additional data collection and analysis is required.

5 Technical Assessment of Through-Ticketing

While understanding the potential demand among the public is important, it is also critical to assess the feasibility of implementing through-ticketing along the Northeast Corridor. Such an assessment would not be complete without understanding the technical constraints faced by the passenger railroads and transit systems operating along the corridor. As highlighted in Chapter 2 of this report, a multitude of fare collection methods and technologies are used by NEC operators. Moreover, there is a fundamental difference between the variable revenue-management based fare structure of Amtrak, and the fixed fares of commuter railroads and local transit providers. Finally, each operator along the corridor is in a unique governance and funding situation, adding perhaps an even more difficult dimension to the challenge of implementing an integrated ticketing program.

The Northeast Corridor Commission consulted with industry experts, reviewed existing literature, and interviewed NEC operators to develop a better understanding of the technical challenges faced by through-ticketing. The three alternatives identified in this report were then evaluated based on the following factors:

1. Trip planning
2. Ticket distribution and payment processing
3. Ticket validation and cancelation
4. Revenue reconciliation and settlement
5. Security
6. Customer service
7. Governance and organizational requirements
8. System requirements
9. Cost and ease of implementation
10. Customer convenience

None of the technical considerations highlighted here appear to be insurmountable, but some are more significant than others. A Third-Party through-ticketing solution or Direct-Sales model have the fewest technical challenges as they rely in part on existing technology platforms and sales infrastructure. Conversely, a Custom NEC Solution would have significant costs but yield the fewest compromises in development, as a through-ticketing system would be developed from the ground-up.

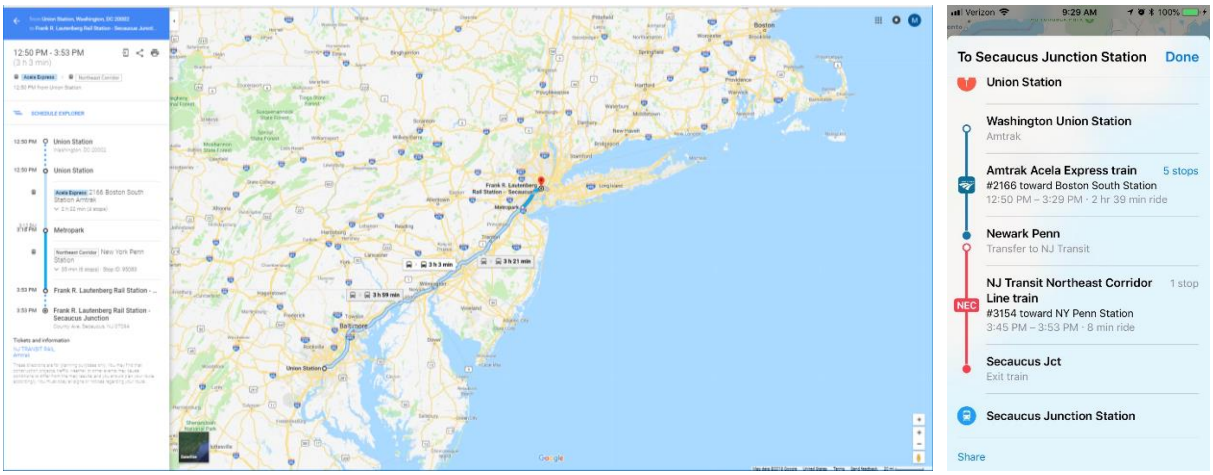
5.1 Trip Planning

Trip planning is an important component of through-ticketing because it enables customers to plan their trip from origin to destination as well as discover through-ticketing options for their journey. Trip planning

functionality requires maps and location information along with the ability to see available routes and modes of transportation – walk, drive, transit, etc.

The General Transit Feed Specification (GTFS) is the open standard that allows transit and rail operators to share service information with mapping services like Google Maps Platform and Apple's MapKit. Any trip-planning solution introduced in conjunction with through-ticketing would likely rely on GTFS. Amtrak and connecting rail and transit operators publish geographic, schedule, and to a lesser degree real-time arrival information through GTFS. One major gap today to integrated trip planning is that few NEC operators provide fare information through GTFS. Users must visit the websites of individual providers to look-up pricing and purchase fares.

Figure 4: Google Maps provides links to Amtrak and NJ TRANSIT for ticketing. Apple Maps does not yet provide fare information.



All three through-ticketing models in this report would have to identify how to integrate Amtrak's variable pricing structure into a trip planning solution. Amtrak differs prices based on fare type, time of day, and type of service. A user would have to put in their actual day of travel and departure time to receive accurate fare information through a general trip planning solution.

5.1.1 Direct Sales Between Agencies

In the first alternative, NEC operators would be responsible for integrating information about connecting rail and transit service into their trip planning and fare selection platforms. For example, Amtrak's website today only allows users to plan a trip between Amtrak-served stations. Even commuter rail stations that currently have a cross-honoring arrangement with Amtrak (e.g. SEPTA's Jefferson and Suburban Stations) do not appear on Amtrak's website. For Amtrak (or another NEC operator) to host through-ticketing information in their trip planner, they would have to work through some key issues:

- **Does the agency integrate connecting services into their own trip planners?** Many European rail operators that offer through-ticketing, do so by selling a day pass for local transit as an add-on to an intercity rail trip. Similarly, Amtrak and SEPTA have an agreement that allows all valid Amtrak ticket holders to take same-day trips aboard SEPTA Regional Rail between 30th Street Station and other Center City stations. Both a flat-rate day pass or cross-honoring agreement require a customer to only select their specific start and end station on the intercity segment of their trip. The challenge for such arrangements is to make

customers aware of through-ticketing opportunities in the absence of end-to-end trip planning. Even if Amtrak sold day passes on connecting railroads, the user may not know whether those passes would get them to their final destination.

- **How should the trip planner define origin and destination?** On mapping services like Google Maps, the user can search an itinerary from their start to end address, however Amtrak only allows station-to-station trip planning. Would an integrated trip planner hosted by Amtrak (or another NEC operator) allow the user to search from their actual start to end location, or merely the nearest rail station? In the case of the latter, how would the user figure out the nearest station to their origin and destination, especially in locations with multiple nearby transit services, all of which may not participate in a through-ticketing agreement?

5.1.2 Third-Party Sales

Trip planning across multiple transit services is already available through several platforms such as Google Maps, Apple Maps, and Wanderu. The main challenge related to trip planning in this alternative would be to integrate fare information from all providers. Currently neither Google nor Apple trip planners support the variable pricing utilized by Amtrak. A third-party trip planner would have to allow the user to select the specific date, time, and fare options. Such features already exist in services like Google Flights, Google's airfare search and trip planning site.

5.1.3 NEC Custom Solution

The main challenge for an NEC custom solution is whether to utilize an existing trip planning platform or develop a natively hosted trip-planner. Like with the direct sales option, the NEC custom solution would have to decide if end-to-end trip planning is even necessary to enable through-ticketing and if so, whether trips should be planned from origin to destination or merely to the nearest rail station. If the NEC solution relied on an existing trip planner like Google Maps, it would need to integrate Amtrak's variable fare types.

5.2 Ticket Distribution and Payment Processing

After planning a trip along the Northeast Corridor, customers need to confirm pricing information, purchase tickets, and obtain valid ticket media. Ideally the system would issue a single through-ticket or provide individual tickets in the simplest possible format.

The ticketing system would require access to fare tables and fare policies from all participating transportation providers. It would likely require an account management solution to keep track of tickets purchased and used by each customer on participating systems within the network. It would also require systems to authorize ticket purchases and process payments. There are several issues related to ticketing and payment processing shared among the three through-ticketing models outlined in this report:

- Would the user purchase a single ticket for their end-to-end journey, or individual tickets for each segment?
- If the ticketing process requires separate tickets for each service, would they be purchased at one point-of-sale or individually? For example, a more simple approach would be to merely link users to the website or ticketing app of all transit services along their itinerary. In such a case, the user would buy directly from each operator.
- What is the pricing of the through-ticket and how is revenue distributed among partnering agencies? Will operators merely charge customers the combined fare of all individual segments or implement revenue

management to stimulate demand and influence trip-choice (e.g. incentivize customers to ride underutilized services)?
- How will providers share fare information with one-another?

In addition to these concerns, there are several issues specific to each model:

5.2.1 Direct Sales Between Agencies

Selling through-tickets directly by NEC operators faces a host of challenges. Except for Amtrak, no operator has an existing platform to sell and manage reservations. If Amtrak were to integrate through-ticketing onto its platform, it would need to set up a system to collect fare information from connecting operators. There are some simplified solutions for direct sales along the NEC; for example VRE's mobile app allows users to buy "step-up" tickets on Amtrak that result in an Amtrak reservation number. This is only available in limited instances.

5.2.2 Third-Party Solution

The main challenge for third-party through-ticketing is how to sell tickets on behalf of Amtrak and other participating rail or transit services. Currently, most third-party solutions merely provide customers fare trip planning and fare information. Google Flights is one approach which creates itineraries for the user without selling fares. True fully-integrated through-ticketing requires global-distribution systems (GDS) along the lines utilized by hotels and airlines to sell inventory through third parties. Online Travel Agencies (OTAs) like Expedia rely on GDSs to sell flights, hotel rooms, and rental cars. Amtrak currently sells tickets through GDSs, and has a limited code-share agreement with United Airlines between select stations along the corridor. There are limited options for third-parties to sell fares on other NEC railroads or transit services. From a technical perspective allowing such sales by a third-party should be more straightforward than for Amtrak as these services do not require reservations.

5.2.3 NEC Custom Solution

The technical aspects of ticket sales for this alternative will vary based on the ticketing/fare payment approach utilized here. Any custom solution faces similar issues to a third-party solution: how to allow for direct sales of Amtrak reservations and tickets for connecting rail and transit services.

One variant of the custom solution explored in this study is a NEC-wide payment method, such as the OV-Chipkaart utilized on all rail and public transit in the Netherlands. Such a platform would provide seamless integration but require extensive re-engineering of fare payment systems across the NEC. This method also raises the complication of making Amtrak reservations as riders would still have to make Amtrak reservations in advance and load the trip to their payment method.

5.3 Ticket Validation and Cancelation

Validation and cancellation are important components of ticketing. A through-ticketing solution under any of the three ticketing models would require one of the three validation methods:

- Visual inspection – often enhanced protection schemes that involve animated electronic images that are difficult to copy. Can be accomplished by paper ticket or on a mobile app.
- Bar codes (sometimes using sophisticated encryption techniques) and,

- Electronic exchange of ticketing data such as with Near Field Communication (NFC).

Visual inspection is the simplest method of validation and cancellation, requiring no field validation and cancellation equipment. But visual inspection does not provide a strong audit trail.

NFC has been the technology of choice for gated transit systems. Some ungated systems have adopted the technology by equipping staff with NFC mobile readers or placing NFC readers at stations and on vehicle fareboxes. Many of the current systems are closed and proprietary, which introduces significant technical challenges to through-ticketing.

Tickets with bar codes for validation and cancellation are growing in popularity. Bar code scanning is relatively simple and technical solutions abound. Amtrak uses a simple unencrypted bar code with a reservation number, but some transit agencies have deployed bar codes with sophisticated encryption techniques that are not compatible with Amtrak's bar codes and require powerful validators.

5.4 Revenue Reconciliation and Settlement

Reconciliation and settlement describes the process of redistributing fare revenue from the seller to all participating railroads and operators. Any agencies participating in through-ticketing must be able to track revenue and assign it to individual operators. There will need to be back-office infrastructure to support the reconciliation, as well as processes in place for fraud investigation, revenue reporting, and auditing.

Unlike the airline industry, no established standards exist for how through-ticketing is handled among rail and transit operators. To implement a fair system, partners will need to answer many questions, including: How are tickets going to be priced? Who will be responsible for selling through-tickets? And, how will the revenue reconciliation process work?

The most complicated questions will likely revolve around revenue allocation. Some agencies (notably MTA) have indicated that their technology and reimbursement agreements are complex just within their own agency's umbrella organization. This complexity can make it difficult for agencies to prioritize through-ticketing with other agencies when they must also distribute fare revenue within their own umbrella organization. To institute interagency revenue sharing, cost/revenue allocation agreements will have to be negotiated, along with a process put in place for revenue reconciliation on a regular basis.

5.5 Security

Security is a key concern for any through-ticketing solution implemented along the Northeast Corridor. The first security-related concern is maintaining the cyber security of the systems supporting through-ticketing, including customer-facing interfaces like websites and mobile apps, and backend systems used to manage reservations and track revenue. All of these interconnected systems need to be maintained and updated. This poses a challenge most on models that lay responsibility for developing, implementing, and hosting through-ticketing on NEC operators. Existing railroads and transit agencies have limited resources and may lack the same sophisticated technology know-how of established third-party partners. Recent high-profile data breaches at airlines like British Airways highlight the challenge organizations, with even decades of experience digitally managing customer payment and reservations, face in light of more sophisticated cybersecurity attacks.

The second major security issue is fraud prevention. Transit and rail operators dedicate considerable resources to reduce the risk of fraud, including fare evasion. Through-ticketing may hand over responsibility for fare sales and media to outside organizations, something many public transportation providers are reticent of doing. Counterfeit tickets could be a major issue depending on the validation method. A more detailed analysis of cybersecurity would be necessary before implementing through-ticketing.

5.6 Customer Service

Any through-ticketing system will have to support four key customer service functions: 1) the issuing of fare media, 2) replacement of fare media, 3) account management, 4) issue resolution and troubleshooting. The customer-service considerations are shared across the three through-ticketing alternatives:

- Who is responsible for handling customer service issues when a problem arises, the ticket-seller or operator? If responsibility is shared among multiple parties, how is the hand-off handled?
- How will through-ticket passengers be handled in cases of service disruption? For example, if a through-ticketed passenger misses a connection to Amtrak due to delays outside of their control, will they be re-accommodated on another train at no cost?

5.7 Governance and Organizational Requirements

Through-ticketing would likely require a corridor-wide governance structure beyond what is provided through the Northeast Corridor Commission. As demonstrated in this chapter, through-ticketing will require coordination across several areas, from customer service and technology, to ticket sales and validation. As the agencies develop the governance process and develop memoranda of understanding, data needs, architecture requirements, the API framework, intellectual property, and security issues will come into clearer focus. Final roles and responsibilities related to through-ticketing will depend largely on the approach to implementation.

5.7.1 Impact on Operating Practices and Labor Agreements

Each of the railroad systems along the corridor have long established operating procedures that may pose an institutional challenge to implementing through-ticketing. Moreover, past labor agreements have limited the scope of existing through-ticketing options at some railroads. For example, right now only MNR employees can sell tickets for their services per their labor agreement. Because of these restrictions, Shore Line East customers are limited to purchasing UniRail tickets only at New Haven, where MNR and Shore Line East service overlap. Such nontechnical issues with through-ticketing could be addressed through negotiations, but they are an area of concern for the railroads.

5.8 System Requirements

Implementing through-ticketing will require investment in both front-end and back-end systems. Some major front-end components include: web and mobile app-based interfaces, on-site ticket sales, fare media, and ticket-sales protocol. Back-end systems support functions not seen by the public, including tracking of reservations, revenue management, settlement systems, and data transmission methods and protocols. **Table 5** summarizes key system requirements by alternative.

Table 5: System Functionality

	Direct Sales by Agency	Third-Party Sales	Custom NEC Solution
Web and mobile-app based interfaces	Would require significant changes to existing NEC provider apps and websites to allow users to plan for and purchase through-ticket itineraries. Amtrak is better set-up to do so compared to other operators.	Existing expertise in developing sophisticated OTAs and travel planning tools for several modes. Existing solutions could be adapted for NEC.	Requires development of custom interface from scratch. Greatest flexibility to create an interface that meets the specific requirements of NEC operators.
On-Site Sales	Potential to sell itineraries in person through existing ticket vending machines (TVMs) and ticket offices.	No established infrastructure to sell tickets at stations.	No established infrastructure to sell tickets at stations. On-site sales could be provided through partnership with individual NEC operators.
Fare Media	Bar-code and visual inspection easiest to implement. Compatibility with NFC-based ticketing possible, especially as agencies adopt common standards through their next-gen fare payment systems. Separate ticket for each leg of trip easier to implement than one ticket due to lack of compatibility between ticketing methods.	Most likely bar-code or visual inspection based. Separate ticket for each leg of trip easier to implement than one ticket due to lack of compatibility between ticketing methods.	Bar-code and visual inspection easiest to implement. Compatibility with NFC-based ticketing possible, especially as agencies adopt common standards through their next-gen fare payment systems. Separate ticket for each leg of trip easier to implement than one ticket due to lack of compatibility between ticketing methods.
Back-End Infrastructure for Sales, Revenue Management, and Data Sharing	Only Amtrak has existing infrastructure to manage reservations. Would need to integrate other operators into reservation system and share relevant information and revenue with participating operators.	Third-party would manage sales and payment process. Would require integration with Amtrak GDS for train reservation. Mechanism needs to be developed to sell fares for other NEC operators, including potential integration into existing revenue management systems.	Back-end system would look similar to that of a third-party, with system linked with Amtrak through GDS and additional mechanism for sale of fares for other NEC operators.

5.9 Cost and Ease of Implementation

Transit operators have expressed concern over the costs and benefits of through-ticketing since implementing it will likely add costs and complexity to fare collection. Retrofitting equipment in the future to be compatible with a unified ticketing system, for instance, would be a complicated and costly process.

Operators also expressed concern about whether offering integrated tickets may lead to revenue loss. Since the implementation of a through-ticketing system along the entire corridor could necessitate third-party ticket sales (which could include other transit agencies and/or private companies), some agencies are concerned about losing revenue from customers who would have bought directly from the agency if through-ticketing did not exist.

No detailed cost estimates have been developed for the three through-ticketing alternatives. Generally, the Direct-Sales and Third-Party models are anticipated to be cheaper than an NEC Custom Solution as they leverage existing technology platforms and sales channels. Third-Party ticketing would spread responsibility for through-ticketing implementation between NEC operators and the private-sector in exchange for some revenue loss due to the processing fees charged by these platforms.

The simplest system to implement would be one reliant entirely on web- or mobile-app-based ticketing solutions. Mobile ticketing is already in wide use along the corridor, with several solutions for bar-code and visual inspection tickets. A mobile-based solution would not require the expensive implementation of through-ticketing at ticket offices or through TVMs.

5.10 Customer Convenience

The easiest to implement through-ticketing options are not necessarily the most convenient options for users. For example, a more straightforward technical implementation of through-ticketing would be a system that redirects the user to each operator's app or website to purchase their tickets. In such a case, the user will need multiple tickets (and potentially multiple types of fare media) to complete their journey. A more straightforward option from the customer perspective is to provide the user a single ticket for their entire journey. However this poses additional technical and bureaucratic challenges.

The type of fare media used in through-ticketing will also impact customer convenience. Customers would prefer solutions implemented through a single app, instead of requiring multiple apps to complete their journey. Mobile bar-code or visual inspection tickets are generally more customer friendly solutions than an NFC enabled card or device, as the penetration rate of NFC is lower than that of smartphones.

Finally, utilizing existing apps and platforms could speed up adoption of through-ticketing. Many customers may be reluctant to download yet another app for the purpose of through-ticketing. Any custom solution would have to invest significant resources in marketing to ensure the public is aware of the option.

6 Potential Through-Ticketing Pilot

This chapter provides a proposed framework to develop, implement, and manage a pilot program to evaluate how through-ticketing arrangements that allow agencies on the NEC to sell one another's tickets might perform, based on the recommended Direct-Sales Model described in the recommendations in Chapter 7. The pilot would help demonstrate the value of through-ticketing by evaluating both its technical feasibility and market acceptance. This chapter includes a general overview of key steps required to further develop a pilot scope, cost, and schedule. The chapter also describes next steps that might be taken to apply this framework to through-ticketing expansion or improvement efforts in development between Amtrak and SEPTA and CTrail.

The basic steps in the pilot framework are:

- Develop pilot objectives,
- Secure participating agencies, business partners, and suppliers
- Adopt business plan,
- Develop project plan,
- Implement pilot, and
- Measure and evaluate results.

6.1 Develop Pilot Objectives

The first key step in pilot development is to develop objectives. The pilot should articulate customer and organization objectives. Customer objectives should include how the piloted solution would enhance the customer experience by simplifying ticketing and travel. The pilot should provide the opportunity to measure customer response to the program, in the form of how many riders choose to use through ticketing and through rider market research surveys to understand why they are using through ticketing or not and, if they are, how they feel about it (customer satisfaction surveys, focus groups, etc.).

Organization objectives should include how the solution would advance agency or organizational goals such as increasing ridership and revenue, improving business processes and supporting systems, and improving service. Pilot objectives should be used to develop the pilot scope as well as success criteria and key performance metrics.

Adoption of sound pilot objectives should lead to a focused pilot scope with supportive functional and technical requirements. The scope could range from very limited to extremely comprehensive based on pilot objectives. A focused pilot with one or two Northeast Corridor partnering agencies could be easier to implement while still evaluating the wider potential for an expanded through-ticketing program across the NEC.

6.2 Secure Participating Agencies, Business Partners, and Suppliers

Once pilot objectives and success criteria are solidified, the pilot effort should confirm participating agencies and any other business partners, suppliers and participants. Even if the pilot project pursues an approach where agencies engage in the direct sale of each other's tickets (as described in Chapter 7), there may be third-party business partners from the financial sector, such as Visa, MasterCard, American Express, Google, PayPal, Samsung, Apple, and card-issuing financial institutions, that would be interested in supporting the pilot. The financial sector is developing significant new products and services geared directly at transportation services.

Ticketing solution providers including Conduent, Masabi, Trapeze, Cubic Transportation, Moovel, etc. may also be interested in the pilot. Several of these providers have existing solutions that support not only through-ticketing, but additional services such as origin to destination trip planning and purchasing, first and last mile solutions, and even Mobility as a Service (MaaS). The pilot may offer NEC agencies the opportunity to capitalize on new innovations and pilot new features.

6.3 Adopt Business Plan

Stakeholders, business partners, and suppliers should develop and adopt a business plan that is aligned with the pilot project objectives and success criteria. The plan should include key business objectives; challenges; required policies, resources, and business processes; supporting technologies and systems; key risks and mitigation strategies; and a pro forma financial projection.

6.4 Develop Project Plan

6.4.1 Scope

A project plan should lay out the critical actions necessary to develop, implement, and measure the pilot. The project plan should include sections on development, testing, training, change management, implementation, information gathering/sharing, logistics and resources, marketing, measurement, and demobilization. It should document resource responsibilities, standard operating procedures, emergency procedures (if applicable), and communications protocols. It will need to address key issues, challenges, risks, and risk mitigation strategies including:

- Ensuring that all pilot stakeholders and participating agencies have the authority to implement the through ticketing pilot. Multi-agency efforts can falter when individual agencies lack a defined champion who has the authority to get the initiative implemented across multiple internal agency departments.
- Clearly defining operating, maintenance, and support plans including roles and responsibilities.
- Synchronizing a range of ticket types and fare policies that may be difficult to standardize (youth, veteran, pets, bikes, peak/off peak, refunds, etc.).
- Ensuring that key functional, technical, data, and business process requirements are clearly mapped to and supported by pilot systems and that any gaps are clearly identified, understood and to the extent possible mitigated.

6.4.2 Schedule

Depending on their scope and complexity, pilots typically require six to twelve months to develop, test and implement. Pilots that include many stakeholders can take significantly longer to implement, particularly when the stakeholders themselves have multiple decision-makers who oversee established and possibly inflexible business processes.

After development, pilots typically are run for six to twelve months. Some pilots are extended and may become multi-year demonstrations, particularly when they are successful. Stakeholders may extend successful pilots to amortize the benefits of the pilot – particularly pilots that have required significant investment of time and resources to implement, or where a permanent solution may require significant time to develop and implement. Some pilots will see an increase in the scope of functionality to further evaluate critical pieces of the pilot business objectives and risk.

6.4.3 Cost

Pilot costs can vary widely depending on scope, duration, and complexity. Responsibilities for costs can also vary. Vendors, particularly emerging vendors, or vendors that see mid- to long-term value from the pilot may be likely to invest in the pilot and reduce or eliminate some costs for host agencies. At a minimum, most pilots require host agencies to contribute in-kind resources along with transaction fees and commissions. In-kind resources may include staff resources, physical access, power, systems and network access, training, change management, legal, marketing, public relations, and communications support. Transaction fees and ticket sale commissions are common in ticketing pilots to cover processing, operating, and maintenance costs in addition to initial development costs.

6.5 Implement Pilot

The next element of the methodology is to implement the pilot according to scope, schedule, and cost.

6.6 Measure and Evaluate Results

Measurement and evaluation of results is a critical component of the methodology. Regular reviews of key performance metrics and success criteria will not only help to identify strengths and weaknesses, but also to assist with adjustments and corrections to the pilot. As noted earlier, an understanding of through-ticketing adoption and satisfaction will be critical to understand whether going from pilot to full implementation will be worthwhile.

6.7 Next Steps

Two current efforts to improve and/or expand through-ticketing arrangements with agencies on the NEC could follow this framework to gather information that would benefit other agencies as they consider advancing similar programs.

The first opportunity is on the newly introduced Hartford Line service between New Haven and Springfield. Currently, passengers have the option of using a Hartford Line ticket to ride Amtrak trains and vice versa. This option exists for all Amtrak's Regional and Shuttle trains between New Haven, CT and Springfield, MA except for the Vermonter. The reverse is true in that passengers who present a valid ticket for Amtrak travel between

New Haven and Springfield can use CTrail Hartford Line trains. Further integration of through-ticketing on this corridor is desired. For example, customers are not currently able to buy a single ticket to or from New York via the Hartford line (with a transfer to/from Metro North or Amtrak at New Haven).

The second opportunity is between Amtrak and SEPTA, where same-day Amtrak ticket holders are already able to ride SEPTA Regional Rail between 30th Street Station and three other Center City stations. Currently for these customers, ticket validation is done by simple visual inspection of the ticket by the conductor. However, SEPTA is also working with Amtrak to expand the current through-ticketing program. Options under consideration would allow customers to purchase a through-ticket from Amtrak to anywhere in the SEPTA Regional Rail system. Customers would be able to use their Amtrak ticket bar codes at new turnstiles at 30th Street Station to enter (or exit if going the other direction) the SEPTA Regional Rail system.

These programs could be evaluated and treated like pilot projects in order to gain additional understanding of challenges and benefits. While treating these efforts as pilots may require additional work to gather information, the results could inform several key questions that other NEC stakeholders might ask as they consider their own through-ticketing programs.

- What were the challenges in negotiating and implementing an agreement?
- Which parts of the agreement worked well? Which did not?
- What has been the customer reaction and satisfaction of through-ticketing? Which features have worked best? Which have not?
- How many customers are using through-ticketing? How many customers are new to the rail network?
- What has been the impact of through-ticketing on revenue?

7 Results and Recommendations

This study responds to a congressional mandate in the 2015 FAST Act to explore the feasibility of through-ticketing among passenger railroads operating along the Northeast Corridor. The Northeast Corridor is home to the largest concentration of rail trips in the United States, and the numerous overlapping passenger railroads create an opportunity for greater service integration. The Northeast Corridor Commission explored a range of strategies that could make it easier to plan and pay for trips on multiple operators in this study.

7.1 Results

Research on through-ticketing in the US and abroad uncovers a wide range of approaches to through-ticketing. Based on that research, the study team identified three potential categories or models for through-ticketing, each of which could be implemented with varying degrees of integration, from a simple solution that makes it easier to plan and purchase fares for an itinerary involving multiple operators, to a true single-ticket fully integrated fare:

1. **Direct-Sales Model**: NEC railroads implement through-ticketing through existing sales channels.
2. **Third-Party Model**: NEC railroads partner with established third-party firms to implement a trip planning and through-ticketing solution.
3. **NEC-Custom Solution**: NEC railroads come together to establish a custom through-ticketing solution that would be centrally managed.

Direct sales already exist in limited instances along the corridor. For instance, New Jersey Transit and SEPTA have for years sold each other's fares for rail trips connecting at the Trenton Transit Center. Amtrak already accepts some commuter railroad tickets (e.g. CTrail Hartford Line and Shore Line East, MARC, VRE) and some commuter railroads accept Amtrak tickets (e.g., CTrail Hartford Line, NJT, SEPTA). Many NEC operators engage in direct sales with other non-NEC operating agencies (e.g., connecting bus/ferry services to MNR and LIRR). Amtrak allows **third parties** to sell its tickets for trips on the NEC (e.g., Wanderu). An **NEC custom solution**, similar to cross-agency railroad trip planning and ticket sales platforms that exist in other countries, would have to be built from scratch.

While there are technical barriers to through-ticketing generally, none of these are insurmountable. Railroads along the corridor use various fare collection methods and standards. Fortunately, smartphone enabled mobile ticketing is helping to solve the lack of compatibility between fare media. Most NEC railroads offer mobile ticketing through a scannable bar code, including Amtrak. Several agencies are implementing next-generation contactless payment which will make it easier to implement a standardized fare payment system through a smartcard or NFC-enabled mobile phone.

There are several non-technical challenges common to implementing any of the through ticketing models. While commuter railroads and transit providers rely largely on fixed fares valid on any train, Amtrak fares are for specific trains and vary widely by type of service, time of service, and how far ahead one books a ticket.

Agencies also have their own fare policies, operating practices, and labor agreements which may inhibit cross-agency ticketing.

Any through-ticketing solution will rely on effective marketing and ease of use to achieve wide adoption by customers. A challenge, but an opportunity to increase rail travel market share, would be to market through-ticketing to infrequent users of the system. Market research conducted as part of the study shows an interest in through-ticketing among the Northeast Corridor travel market but an unwillingness among the public to pay a premium for such convenience.

Table 6: Comparison of Through-Ticketing Models

	Direct-Sales Model	Third-Party Model	NEC-Custom Solution
Strengths	• Leverages existing fare sales channels like Amtrak.com, station ticket offices, and TVMs. • Existing customer base using these sales channels. • Can be implemented in incremental manner.	• Private-sector expertise to support trip planning and ticketing solutions. • Shares implementation risk between NEC operators and third-party partners. • Established platforms already have a large user base.	• Allows for solution truly customized for the needs of NEC consumers. • Moves implementation burden away from existing operators.
Weaknesses	• Only Amtrak can currently book and manage reservations. • Limited internal capacity and resources to expand through-ticketing. • Could result in inconsistent customer experience along corridor.	• Reduced control among NEC operators over solution. • Depends on an interested partner to support implementation.	• Lack of existing user base will require extensive marketing to ensure adoption. • May require changes to existing operating practices among NEC operators. • No existing organization exists to oversee development and implementation.

	Direct-Sales Model	Third-Party Model	NEC-Custom Solution
Examples of Implementation	• Cross honoring (e.g. free SEPTA Regional Rail travel to select stations with Amtrak ticket). • Sale of flat-rate day pass for local travel with Amtrak tickets (model commonly used in Europe). • Sale of fully integrated through-ticket.	• Third-party trip planner that links users to where they can buy each individual fare. • Third-party sales of integrated through-ticket. Likely through a bar-code or visual inspection ticket by paper or mobile app.	• NEC customized trip planner that links users to where they can buy each individual fare. • NEC mobile ticketing app. • Creation of contactless fare card/travel wallet that is accepted by all NEC operators.

7.2 Recommendations

The Commission recommends voluntary improvement and expansion of existing direct sales arrangements. More specifically, future efforts should consider ways to:

- Increase the number of origin-destination pairs available for through ticketing between partner agencies
- Increase the number of partner agencies with through-ticketing arrangements
- Address the non-technical barriers to successful through-ticketing identified in this study such as fare policies, operating practices, and labor agreements

The Commission believes that this model carries most benefits of third-party sales and/or an NEC custom solution model without the additional potential complexities, risks, and costs. This recommendation does not necessarily preclude future advancement of other models should factors such as available funding, organizational capacity, and emergence of private-sector partnerships change over time. Potentially the corridor could implement one model in the interim, before moving to another solution in the long-term.

The Commission recommends other cross-agency efforts that may be prerequisite for maximizing the potential benefit of any investments in through-ticketing systems. These include:

- Increase customer awareness of potential through-travel options through marketing and improved trip planning features
- Coordinate schedules of potential connecting services to increase the attractiveness of through travel

The Commission recommends monitoring current efforts to improve and expand existing direct sales agreements between Amtrak and SEPTA and CTrail to gather data on the costs, benefits, challenges, and best practices of through ticketing. While this study did include a limited amount of market research, that effort only gathered information on customer attitudes toward potential through-ticketing alternatives. There was insufficient data to quantify the potential market for expanded through-ticketing, the potential number of net new rail trips that might be generated, or which agencies might benefit most. More empirical analysis is required to fully understand the costs and benefits of implementing new and/or improved direct sales arrangements between NEC operating agencies.

The Commission recommends NEC operators work to establish common standards and parameters for through-ticketing to maximize the ease of through ticketing implementation. While future efforts should proceed at a pace and at a scale deemed appropriate by individual agencies, such standards should make implementation easier for agencies and improve the ease of use for NEC rail customers, thereby maximizing the goal of **improving the intercity rail and transit experience in order to recruit new riders and enhance the experience of existing riders.**