Intermodal Transportation Facilities

Research of Viable Attributes and Potential to Integrate Curbside Intercity Buses

November 2013

written by
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School of Public Policy & Administration
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Preface and Acknowledgements

As the Director of the University of Delaware’s Institute for Public Administration (IPA), I am pleased to provide this report, Intermodal Transportation Facilities: Research of Viable Attributes and Potential to Integrate Curbside Intercity Buses. This is a follow-up report to Curbside Intercity Bus Industry: Research of Transportation Policy Issues and Opportunities, an August 2013 publication by IPA. Among topics for future research and discourse is the need to plan for and invest in intermodal transportation facilities that serve all modes of transportation and facilitate interconnections among all modes.

This report explores the concept of intermodalism and whether privately owned curbside intercity buses can be integrated into intermodal transportation facilities—particularly “legacy” rail stations that already are targeted for federal funding and other investment. The report concludes with a matrix that explains which attributes are supportive of intermodal facilities and how the matrix may be used as part of a planning framework.

IPA is grateful for funding support from the University of Delaware University Transportation Center (UD-UTC) through support from the United States Department of Transportation (USDOT). I would like to thank the project team—IPA’s Marcia Scott (Project Manager), Eileen Collins, and Christopher Kelly as well as UD-UTC Director Sue McNeil. Additional thanks go to IPA staff members Lisa Moreland for editing support and Sarah Pragg for designing the cover and formatting the document.

IPA addresses the policy, planning, and management needs of its partners through the integration of applied research, professional development, and the education of tomorrow’s leaders. This study is an important part of this effort, as focus on intermodal transportation can lead to an increase in quality of life for the country as a whole.

Jerome R. Lewis, Ph.D.

Director, Institute for Public Administration
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1. Executive Summary

This report builds on Curbside Intercity Bus Industry: Research of Transportation Policy Opportunities and Challenges, a document issued in August 2013 by the Institute for Public Administration (IPA) at the University of Delaware. Outpacing air and rail transportation, the curbside intercity bus industry now represents the fastest growing mode of intercity travel in the United States. The report highlights the industry’s unresolved transportation policy issues associated with its unprecedented growth—particularly within the Northeast Corridor (NEC). Follow-up on several topics of research was suggested, including the need to plan for and invest in intermodal transportation facilities that serve all methods of transportation and facilitate interconnections among all modes.

This topic of research is critically important for the resiliency of the NEC, within the BosWash (Boston, Massachusetts, to Washington, D.C.) megapolitan area. New solutions are being considered to effectively manage and expand multimodal transportation systems as density increases within this transportation network. One proposed solution is reinvigorating intermodal transportation facilities—particularly “legacy” rail stations—to serve as hubs of transportation as well as centers of economic, commercial, and mixed-use activity. The National Railroad Passenger Corporation (Amtrak) is advancing plans to fund, finance, and deliver its vision for high-speed rail (HSR), rail station and infrastructure improvements, and system-capacity upgrades. To accomplish these plans, Amtrak is seeking additional investment for its private rail system, which is already highly subsidized by the federal government. Incorporating multiple modes of transportation—including curbside intercity buses—into transportation facility master plans can further leverage public and private investment/resources to better meet the needs of all transportation users.

The primary goal of Intermodal Transportation Facilities: Research of Viable Attributes and Potential to Integrate Curbside Intercity Buses is to assess the potential of integrating curbside intercity bus operations within intermodal transportation facilities. The report highlights the meteoric rise of the curbside intercity bus industry, NEC transportation pressures, the concept of intermodalism, and the need for intermodal facilities. While barriers to intermodalism exist, report findings suggest that development and investment in intermodal transportation facilities—which serve as a hub for all modes of transportation, including curbside intercity buses—will promote a more integrated and sustainable transportation system. Through a case-study approach, viable attributes of successful intermodal facilities in the NEC were identified. A matrix was developed to provide a planning framework and consider viable attributes of successful intermodal facilities. This planning framework approach is applied to Washington, D.C.’s Union Station, which is identified as a model intermodal transportation facility.
2. **Introduction**

2.1 **Need for Research**

The Institute for Public Administration (IPA) at the University of Delaware issued *Curbside Intercity Bus Industry: Research of Transportation Policy Opportunities and Challenges* in August 2013. The curbside intercity bus industry is a relatively new mode of transportation and has experienced exponential growth since operations began in the Northeast Corridor (NEC) in 2008. Unlike traditional intercity bus companies (e.g., Peter Pan and Greyhound) that operate from terminals, corporate curbside intercity bus companies (e.g., Megabus, BoltBus, and DC2NY) and “Chinatown” bus operators save money and time by selling tickets online and operating from street curbsides. The report highlights transportation policy issues stemming from the deregulation of the bus industry, a fragmented regulatory environment, and impacts of the unprecedented growth of the new curbside intercity bus industry. It notes that government rulemaking, legislation, policymaking, adoption of regulatory guidelines, and management approaches are attempting to address issues stemming from the lack of bus-industry regulation and unscrupulous operators. Despite the new regulatory emphasis, transportation policy challenges and opportunities abound.

The report concludes, “The effectiveness of policies and regulations is dependent on sufficient federal funding and resources, multi-jurisdictional coordination, effective enforcement of safety regulations, and consumer/stakeholder outreach and education…Policymaking needs to be comprehensive, strategic, outcome-oriented, and in tune with concerns for safety, security, and fair competition. Federal transportation programs need to provide resources/funding to ensure effective oversight and enforcement activities and invest in intermodal transportation infrastructure and facilities” (Scott, Wicks & Collins, *Curbside Intercity Bus Industry: Research of Transportation Policy Opportunities and Challenges*, 2013).

The report suggests that additional investigation, policy analysis, public engagement and outreach, and policy forums are needed to understand evolving issues and develop a comprehensive research agenda. While the August 2013 report provided a snapshot on the state of the industry, it also was intended to serve as a foundation for future research. Several transportation challenges and opportunities, as they relate to inclusion of curbside intercity buses in intermodal facilities, were identified. Follow-up on several topics of research was suggested, including the need to improve intermodal linkages to ensure smooth and efficient transfers among modes at transportation hubs and plan for an integrated network of individual transportation facilities, services, modes, and linkages.

2.2 **Motivation for Research**

Intermodal transportation facilities can be described as hubs where interfaces and interconnections occur among transportation systems and modes of travel (Henry and Marsh, 2008). Generally, passengers arrive at these transportation hubs via one mode and leave by another (e.g., airplane; long-distance, regional, light, or commuter rail; public bus transit; private intercity bus; charter bus; limousine service; private automobile; taxi; rental car; car share; bicycle; or on foot).
Intermodal transportation facilities are strategically located. They most often are located in major metropolitan areas in proximity or convenient access to central business districts, major centers of employment, public transit, and activity-oriented destinations. Successful intermodal transportation facilities support and enhance transit usage, promote seamless transfers among modes, provide clear access to transportation networks, maximize transportation options, and create efficiencies of shared costs and transportation infrastructure (SMWM/Arup and Associated Consultants, 2004).

In addition to providing transportation benefits, intermodal transportation facilities are being reinvigorated as hubs of economic, commercial, and mixed-used development activity. Financing strategies and development techniques, such as public-private partnerships, have catalyzed reinvestment in public infrastructure and adjacent property. The older “legacy” or iconic “union stations” are being revitalized to serve as destinations in their own right and targeted to support economic and transit-oriented development. Most notably, master plans for Washington, D.C.’s Union Station consider the need to centralize transportation, mitigate congestion, facilitate intermodal connectivity, and enhance its potential for economic development. Curbside intercity bus operations are included within Union Station’s current and future operational plans.

While the curbside intercity bus industry continues to expand, efforts also are underway to address increasing traffic congestion, travel demands, and aging infrastructure within the NEC. Amtrak is advancing plans to fund, finance, and deliver its vision for high-speed rail (HSR), rail infrastructure improvements, and system-capacity upgrades. These plans acknowledge the need to leverage additional federal funding for the current government-subsidized rail system. In addition, financial support is sought from the private sector and state and local governments.

With respect to transportation demands within the NEC—and competing interests among transportation modes—several policy issues come to mind. First, should government investment in transportation infrastructure (e.g., intermodal transportation facilities) benefit all modes of transportation—whether publicly or privately owned? Second, how can the needs of all stakeholders and modes of transportation be equitably balanced to encourage fair competition among modes? Third, what are viable attributes of intermodal transportation facilities that consider all modes—including curbside intercity buses? Finally, does the business model of the curbside intercity bus industry support the fees or costs associated with operating from intermodal transportation facilities instead of, or addition to, transient curbside locations?

### 2.3 Research Goal

The primary goal of *Intermodal Transportation Facilities: Research of Viable Attributes and Potential to Integrate Curbside Intercity Buses* is to assess the potential of integrating curbside intercity bus operations within intermodal transportation facilities. This research focuses on identifying viable attributes of successful intermodal facilities in the NEC that have the potential to support integration of curbside intercity buses.
Research tasks included:

- Conducting a literature review to:
  - Provide an overview of the growth of the curbside intercity bus industry.
  - Highlight factors that support intermodalism and the development of intermodal transportation facilities that incorporate all modes of transportation and provide seamless connections.
  - Summarize challenges and barriers to intermodalism that may hinder inclusion of curbside intercity buses within intermodal transportation facilities.
  - Provide a synopsis of funding opportunities for new or improved intermodal transportation facilities.

- Conducting case studies of major intermodal transportation facilities within the NEC—from Washington, D.C., to Boston, Massachusetts—to identify the extent to which curbside intercity buses are being or have been considered in the planning, design, or operations of facilities.

- Developing a matrix to highlight key attributes that are either highly, somewhat, or not supportive of intermodal transportation facilities.
3. Background

The Northeast Megaregion consists of 13 states from West Virginia to Maine and comprises 18 percent of the U.S. population. It is expected to grow 18 percent from 2010 to 2040—adding 15 million people to total over 87 million (Regional Plan Association and America 2050, 2012). In addition, it is more than just a network of surface transportation systems. It also is regarded as a key driver in the national economy. The Northeast Megaregion accounts for “20 percent of the nation’s Gross Domestic Product [which] is produced on only 2 percent of its land area” (Regional Plan Association, 2013).

The Northeast Corridor (NEC), within the BosWash Northeast Megapolitan area, is defined as a “multimodal and multi-generational network connecting Boston, Massachusetts, to Washington, D.C.” (Oswald, Evaluating the Current State of the BOSWASH Transportation Corridor and Indicators of Resiliency, 2009). It is “characterized by high-density, highly developed infrastructure, growing population, technological advancements, and intricate transportation systems” (Oswald, McNeil, Ames & Gayley, 2012).

The oldest transportation corridor in the U.S., BosWash is organized around an evolving network of surface transportation modes. With the greatest concentration of tracks in the U.S., rail is regarded as the backbone of the BosWash corridor, connecting a string of major urban areas. The rail system has served as the basis for current land use patterns and the development of the national highway system, which provides the current network of interconnected roadways within the BosWash corridor (Oswald, McNeil, Ames & Gayley, 2012).

3.1 Problem Statement

Population growth pressures have increased the density of the transportation network across all transportation modes within the NEC. In the last half-century, greater automobile ownership and usage has presented challenges including land use issues and sprawl, traffic congestion, environmental degradation, and socioeconomic impacts. The need to address these issues has been a topic of study by researchers evaluating the current state, performance, and resiliency of the BosWash transportation corridor (Oswald, McNeil, Ames & Gayley, 2012).

Long-term transportation infrastructure investment is considered a solution to meet future transportation demands, move high volumes of passengers and freight, increase mobility options, and support sustainable economic growth. The I-95 Corridor Coalition asserts that continuing with a “business-as-usual approach,” without political, institutional, and financial changes, will be detrimental to the U.S. transportation system. Possible consequences include increases in vehicle miles traveled (VMT), interstate delays and congestion, growth in fuel consumption and harmful emissions, loss of transit market shares, greater truck volumes, and increased highway and rail bottlenecks (Cambridge Systematics, Inc., 2008).

3.2 Proposed Solutions

As the density of transportation networks increases, transportation policy and planning professionals are seeking solutions to effectively manage and expand multimodal infrastructure
systems. Several approaches are supported to meet the infrastructure, economic development, and environmental challenges of U.S. transportation corridors. One approach is to apply the concept of resilience to megaregions and develop performance measures to evaluate corridor resilience (Oswald, McNeil, Ames & Gayley, 2012). Resiliency of the NEC will, in part, depend on its ability to respond to multimodal transportation pressures and issues.

The I-95 Corridor Coalition advocates for “implementation of aggressive multimodal investment, institutional, and operation and management strategies...” to “enhance the quality of transportation, the vitality of the economy, and the contribution of the broad corridor-wide region to address the issues of climate change and energy” (Cambridge Systematics, Inc., 2008).

The Obama administration has proposed, as part of the Fiscal Year (FY) 2014 budget, the establishment of a National Infrastructure Bank to provide greater public infrastructure investment. It would require a substantial up-front investment connected to a six-year reauthorization of the surface transportation program. Intended to leverage private and other non-federal government resources, this plan would “rebuild 150,000 miles of roads, construct and maintain 4,000 miles of passenger rail, and rehabilitate or reconstruct 150 miles of runways while upgrading our outdated air traffic control system, bringing American aviation travel into the 21st century” (U.S. Department of the Treasury with the Council of Economic Advisers, 2010). Proponents value its potential to leverage private investment and resources. Opponents argue that this idea will continue deficit spending, require taxpayer dollars, fail to stimulate the economy, and undermine state department of transportation control (Glans, 2013).

While policymakers have not acted on the National Infrastructure Bank concept, there is increased pressure for federal investment to expand the network of highways, interstate routes, and interconnectivity among all modes of transportation. The Moving Ahead for Progress in the 21st Century Act (MAP-21) provided for an expansion of the U.S. Department of Transportation’s (USDOT) Transportation Infrastructure Finance and Innovation program. Funding increased from $122 million in Fiscal Year (FY) 2012 to $1.7 billion for FY 2013 through FY 2014 (Miller, Costa & Cooper, 2012). Under this program, public and private investors in large-scale surface transportation projects are eligible for low-interest loans, loan guarantees, and lines of credit.

3.3 Vision for NEC Rail Service Expansion and Service Improvements

Increased investment in high-speed rail and rail infrastructure also is envisioned as part of the solution to enhance mobility and spur economic development in the Northeast Megaregion. The National Railroad Passenger Corporation (Amtrak) released two planning reports in 2010, which served as the foundation for developing a vision for expanding capacity within the NEC. The Northeast Corridor Infrastructure Master Plan set the stage for collaborative regional rail planning in the NEC and outlined investment needs within its core network of rail lines that connect high-population density and growth areas (The NEC Master Plan Working Group, 2010). This plan proposed bringing the current rail system to a state-of-good repair; ensuring reliable service for intercity, commuter, and freight users and meeting ridership demand needs through 2030.
The second proposed Amtrak plan, *A Vision for High-Speed Rail in the Northeast Corridor*, describes plans to expand capacity on the NEC rail network. A next generation high-speed rail (NextGen HSR) proposes additional travel-time and service-reliability improvements to alleviate both air and automobile congestion. Envisioned are dedicated high-speed rail alignments, enhanced stations and equipment, and a premium-level service that will connect major NEC hub cities (i.e., Boston, New York, Philadelphia, and Washington, D.C.) to smaller cities, airports, and suburban hubs (Amtrak, 2010).

Since the release of the 2010 reports, Amtrak has merged the two plans into the NEC Capital Investment Program. This program outlines an investment program that would need to be implemented in a long-term, phased-in approach to improve and expand the NEC. It upholds Amtrak’s pledge to undertake near-term master plan projects while advancing the long-term development of its NextGen HSR network in the NEC.

*The Amtrak Vision for the Northeast Corridor: 2012 Update Report* summarizes actions taken by Amtrak and other stakeholders since the release of the 2010 planning reports. The report discusses key findings of the NEC Business and Financial Plan and explains how Amtrak will finance its vision for NEC enhancements and service improvements. Finally, the report provides a foundation for a NEC environmental analysis and planning process to be led by the Federal Railroad Administration (FRA) (Amtrak, 2012). Because current federal, state, and local transportation investment programs are insufficient to finance this vision, a combination of funding, policy decisions, and cooperation will be required from all levels of government, NEC users, regional partners, the private sector, and Amtrak (Amtrak, 2012).

The next step is for FRA to complete a Passenger Rail Corridor Investment Plan (PRCIP) by 2015. The plan will consist of two parts. A long-term Service Development Plan will define the overall scope and approach for future intercity passenger rail service along the NEC, and a National Environmental Policy Act (NEPA) will provide an environmental impact analysis that is required to create a NEC investment plan for the next 30 years (Amtrak, 2012).

### 3.4 Growth of Curbside Intercity Bus Industry

The Federal Transit Administration (FTA) has defined intercity bus service as:

> Regularly scheduled bus service for the general public, which operates with limited stops over fixed routes connecting two or more urban areas not in close proximity, which has the capacity for transporting bagage carried by passengers, and which makes meaningful connections with scheduled intercity bus service to more distant points, if such service is available...Intercity service is not limited by the size of the vehicle used or by the identity of the carrier (Schilling and Brooks, n.d.).

FTA provides the following characteristics of intercity bus service:

- Provides regularly scheduled bus service.
- Is available to the general public.
- Makes limited stops.
- Operates on fixed routes.
Connects two or more urban areas not in close proximity.
- Makes meaningful connections (if available).
- Is predominantly a passenger service (any package/goods service incidental).
- Is not a commuter service.
- Is not air, water, or rail service (bus only).

In addition, while there is no official, agreed-upon definition, curbside intercity buses are described in a 2011 National Transportation Safety Board (NTSB) Report on Curbside Motorcoach Safety as “those in which interstate motorcoach carriers conduct scheduled trips from one city to another city or a destination and originate or terminate at a location other than a traditional bus terminal; most of these operations pick up or discharge passengers at one or more curbside locations” (National Transportation Safety Board, 2011). Unlike conventional motorcoach carriers like Peter Pan, Trailways, and Greyhound, newer curbside intercity bus operators typically do not utilize a bus terminal, sell tickets primarily online, offer onboard amenities such as Wi-Fi, and offer point-to-point, express service between major cities. A newer business strategy of these curbside operators is to expand service from urban point-to-point destinations to regional, short-distance routes, college campuses, and suburban destinations.

The industry can be divided into two main categories: Chinatown bus operators and corporate carriers (e.g., BoltBus, DC2NY, and Megabus). Increasingly, new subsidiaries of niche-oriented conventional carriers (e.g., Greyhound) also are joining the ranks of the curbside intercity bus industry to meet the growing demand for low-cost, express, point-to-point transit services.

Once a declining industry, popularity of the curbside intercity bus services has been spurred by competitive prices, convenient online ticketing, the rise in “transit lifestyles,” and access to free, onboard Wi-Fi technology that caters to a younger demographic. Ridership is growing due to competitive pressure for new services that appeal to cost-conscious, tech-savvy, young riders seeking economic fares to travel destinations.

The renaissance of the privately owned curbside intercity bus industry over the past decade has brought a drastic increase in the utilization of this alternative form of transit and provides policymakers with a new opportunity to expand intermodal transportation across the country. According to the American Bus Association (ABA), the trade association for buses and motorcoaches, nearly 700 million trips were provided by this industry in 2010 (Pantuso, 2012). The privately owned intercity bus industry is estimated to have a total annual economic impact of $112 billion for the country, with $40 billion coming from the wages paid to over a million employees and $16.5 billion coming from state and federal taxes (Pantuso, 2012). Outpacing air and rail transportation, the industry is the fastest-growing form of intercity travel for the fifth consecutive year with a 7.5 percent growth rate (Schwieterman, Antolin, Largent & Schulz, 2013).

In The Motor Coach Metamorphosis: 2012 Year-in-Review of Intercity Bus Service in the United States, the Chaddick Institute for Metropolitan Development at DePaul University noted that one trend was that BoltBus and Megabus, which account for nearly 24 percent of intercity bus operators in the country, are working to find new pick-up and drop-off locations to better
accommodate their customers (Schwieterman, Antolin, Largent & Schulz, 2013).

As the industry continues to increase in popularity—and as customers’ expectations continue to grow—the potential for the successful incorporation of privately owned intercity buses into intermodal facilities will increase, providing policymakers with a great opportunity to integrate this method of travel into the transportation network of the country. A question remains whether the curbside intercity bus industry’s business model can support costs of operating from permanent intermodal facilities.
4. National Spotlight on Intermodalism

4.1 Intermodalism

The National Center for Intermodal Transportation views intermodalism as a:

Point-of-view [that] involves looking at how individual modes can be connected, governed, and managed as a seamless and sustainable transportation system. That is, the fundamental objective of intermodalism is not to optimize a single mode of transportation but to integrate the modes into an optimal, sustainable, and ethical system. Such a system should promote efficiency, safety, mobility, economic growth and trade, national security, protection of the natural environment, and enhancement of human welfare (National Center for Intermodal Transportation, n.d.).

The primary goal of intermodalism is to incorporate various modes of transportation into a system that not only transports freight and people, but also improves community livability. This goal is achieved by taking a holistic approach to transportation policy that incorporates land use, demographic, socioeconomic, environmental, health, security, and public policy issues.

4.2 Intermodal Transportation: A National Goal

The National Commission on Intermodal Transportation (NCIT), created by the Intermodal Surface Transportation Efficiency Act of 1991, explained how a focus on this strategy could benefit the country. In its report, Toward a National Intermodal System, the commission noted that utilizing intermodal transportation would lead to the:

Lowering [of] transportation costs by allowing each mode to be used for the portion of the trip for which it is best suited; increasing economic productivity and efficiency, thereby enhancing the Nation’s global competitiveness; reducing the burden on overstressed infrastructure components by shifting use to infrastructure with excess capacity; generating greater returns from public and private infrastructure investments; improving mobility for the elderly, disabled, isolated, and economically disadvantaged; and reducing energy consumption and contributing to improved air quality and environmental conditions (National Commission on Intermodal Transportation, 1994).

Basically, NCIT’s argument is that intermodal transportation is a more efficient use of resources and infrastructure as opposed to an automotive-focused strategy that leads to congestion, inefficiency, and transportation justice issues—where certain segments of the population cannot access the nation’s transportation system due to the cost of travel. According to the NCIT, it became apparent during the 1990s that for many cities “a central downtown multimodal transportation center would be the heart of a viable passenger intermodal system” (National Commission on Intermodal Transportation, 1994). Ultimately, the national goal is to create an intermodal transportation system. This can be accomplished through the construction of facilities that accommodate multiple modes of transportation (e.g., rail, buses, automobiles, taxis, walking, and bicycling) in which individuals can seamlessly transition from one mode of transit to another in a safe, efficient, and cost-effective manner.
4.3 Livability Implications

While the NCIT report was written in 1994, the ideas generated are still a driving force behind national transportation policy today. One of the key goals set by the U.S. Department of Transportation (USDOT) in its Strategic Plan for FY 2012-2016 is to “foster livable communities through place-based policies and investments that increase transportation choices and access to transportation services” (U.S. Department of Transportation, 2012). The rationale behind promoting this goal is that it will drastically improve the quality of life for Americans across the country.

Under the current system, which is focused primarily on automotive transportation, the “average American adult between the ages of 25 and 54 drives over 12,700 miles per year...[spends] approximately one month each year in the car, and the average American household spends $8,220 [which is approximately 17 percent of the GDP per capita for the country (Central Intelligence Agency, 2013)] per year to buy, maintain, and operate personal automobiles” (U.S. Department of Transportation, 2012). This reliance on the automobile is due to the fact that “fewer than one in 20 households are located within a half-mile of rail transit and only 53 percent of Americans have access to any form of public transportation service” (U.S. Department of Transportation, 2012), meaning that nearly half of Americans have no access to alternative forms of public transportation. Access and choice, primarily in urban areas, can be increased drastically through the provision of intermodal facilities, which can improve coordination between modes of transportation, including privately owned intercity buses.

4.4 Sustainability and Resiliency

USDOT’s Livability Initiative was launched in 2009 to focus efforts on developing transportation policies to promote a more integrated transportation network that links transit with the needs of communities nationwide. The intent of this initiative is to provide community members with more transportation choices, enhanced public transit, and better access to destinations of daily living including places of employment, housing, and health, education, and community service centers. Transit is deemed as the essential linkage to community livability, economic prosperity, and sustainability (U.S. Department of Transportation, 2012).

According to the NCIT, an intermodal system will also allow for efficient:

Evacuations from coastal areas under hurricane threat; evacuation of metropolitan areas affected by earthquake, industrial accidents, or terrorist attacks; relief services to communities affected by disaster; highway closures due to fires, landslides, and accidents; recovery operations in devastated areas; and restoration of transportation services after serious disruption (National Center for Intermodal Transportation, n.d.).

Access to a reliable intermodal transportation system can increase the resiliency of a community by allowing it to withstand times of economic hardship or evacuate citizens during emergency situations caused by natural disasters or terrorist attacks. Areas that have access to alternative forms of transportation are more resilient in times of economic turmoil because they are still targeted for development, and real estate values are, on average, higher than comparable homes in the rest of the area (Newman, 2013). The National Association of REALTORS® (NAR) notes
that transit-oriented developments (TODs), particularly ones with transit access that link the downtown with other major employment centers, have held their property values and fared better than comparable properties during the economic downturn (Van Gieson, 2013). Moreover, a recent study released by the American Public Transportation Association and NAR affirms that there is a connection between resilient property values and proximity to public transportation.

NAR Chief Economist Lawrence Yun says, “Higher home values reflect greater market demand for areas near public transportation...Transportation plays an important role in real estate and housing decisions, and the data suggests that residential real-estate near public transit will remain attractive to buyers going forward. A sound transportation system not only benefits individual property owners, but also creates the foundation for a community’s long-term economic wellbeing” (Daily Real Estate News, 2013). Individuals who live in neighborhoods with access to a reliable intermodal transportation system also are less susceptible to rising gas prices. Even in times of volatile fuel prices and availability, people in transit-friendly communities can continue to live their lives without interruption (U.S. Department of Transportation, 2012). Ultimately, an intermodal transportation focus can allow a community to withstand impacts of economic fluctuations, while also allowing it to develop in a sustainable manner.

4.5 Position of Industry Advocates

ABA argues that a key component to creating a “seamless transportation network that enables passenger choice” is to do “away with the concept of rail stations, airports and mass transit centers and replace them with multimodal facilities” (Pantuso, 2012). The main way that the construction of intermodal centers can be facilitated is by providing states with the “funding flexibility to determine how best to serve the needs of the traveling public” (Pantuso, 2012). ABA explains that the funding mechanisms in place in the United States are flawed. Grants are generally tied to single modes of transportation, create a biased marketplace, promote poor business practices, and ultimately are detrimental to the country as a whole because they put some alternative forms of transportation, such as intercity buses, at a competitive disadvantage (Pantuso, 2012).
5. Need for Intermodal Facilities

5.1 Environmental Concerns
Another key strategic goal for USDOT is to “advance environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources” (U.S. Department of Transportation, 2012). While progress has been made toward achieving this goal over the years, transportation-related activities currently account for 28 percent of the total energy use in the United States and created approximately 33 percent of the total greenhouse gas emissions in 2009 (U.S. Department of Transportation, 2012). To reduce greenhouse gas emissions, the USDOT aims to promote the use of alternative forms of transportation such as “transit, car- and van-pooling, intercity passenger buses, rail...biking, and walking” (U.S. Department of Transportation, 2012).

According to a study conducted by Drexel University that focused on the impact that BoltBus, a privately owned intercity bus company, had on the City of Philadelphia, this mode of transportation releases much less carbon emissions (50 grams per passenger mile) than the alternatives including Septa/NJ Transit (201 grams), Amtrak (186 grams), car (239 grams), or air travel (234 grams) (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012). When compared to a single-passenger car, a BoltBus will produce less than one-sixth of the carbon emissions (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012). Another positive benefit is that a BoltBus has the capacity to carry 50 passengers, which, in turn, means that each bus could potentially remove 50 single-passenger cars from the nation’s highways, greatly reducing the congestion that plagues the country’s roadways in urban areas (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012).

5.2 Congestion Relief
One of the primary reasons necessitating the planning, design, and construction of intermodal facilities is traffic congestion. According to the Texas A&M Transportation Institute, traffic congestion is “the result of an imbalance between travel demand and the supply of transportation capacity; so if the number of people or jobs goes up, or the miles or trips those people make increases, the road and transit systems also need to expand (Schrank, Eisele & Lomax, 2012). Unfortunately, due to financial costs and other barriers, the expansion of road and transit systems has not been able to sufficiently meet the transportation demands of the nation, leading to congestion. The negative effects caused by traffic congestion for 2011 included $121 billion of costs related to time and fuel, 5.5 billion hours spent in traffic, and an added 56 billion pounds of carbon dioxide released into the atmosphere (Schrank, Eisele & Lomax, 2012). For the average commuter this meant 38 extra hours spent waiting in traffic and 19 gallons of wasted fuel. For commuters who live in areas with over three million people, the traffic delays rose to an average of 52 hours (Schrank, Eisele & Lomax, 2012).

It is expected that the negative effects of congestion will be exacerbated over time due to an increase in population and travel demand (Schrank, Eisele & Lomax, 2012). It is estimated that by 2020 the negative effects will include $199 billion in costs due to wasted time and fuel and approximately 8.4 billion hours of traffic delays (Schrank, Eisele & Lomax, 2012). The average
A commuter will face an extra $1,010 in costs due to congestion and will spend 45 hours waiting in traffic (Schrank, Eisele & Lomax, 2012).

To help mitigate the effects of congestion, the Texas A&M Transportation Institute advocates for an approach that will utilize “a different mix of solutions...[because] some areas might be more amenable to construction solutions, [while] other areas might use more travel options, productivity improvements, diversified land use patterns or redevelopment solutions. In all cases, the solutions need to work together to provide an interconnected network of transportation services” (Schrank, Eisele & Lomax, 2012). The analysis provides further details on the benefits of multimodal transportation by explaining that “travel capacity increases through the use of transit modes that can carry more passengers per vehicle” and “commuters [who] choose to use the alternative mode [of transportation] generally experience less congestion by avoiding a driving commute through highway congestion points” (Texas A&M Transportation Institute, 2013). Ultimately, the utilization of multimodal transportation will lead to a reduction in the costs in time and resources related to congestion. As a result of changing economic and demographic factors, the current focus on transportation through the use of personal automobiles no longer can be sustained.

### 5.3 Changing Demographics

Due to changing demographic trends, primarily the growth of “older, non-family, non-white households [that] have historically used transit in higher numbers,” it is expected that demand for alternative forms of transportation will increase greatly in the coming decades (U.S. Department of Transportation, 2012). The older adult population, of which 71 percent desire to live within walking distance of some form of transit (U.S. Department of Transportation, 2012), will see the largest growth. By 2050, it is estimated that approximately one in five Americans will be 65 or older, with the total population of the country expected to range from 404–440 million individuals (Shrestha and Heisler, 2011).

These changing transportation preferences also were noted in a study conducted by the Federal Highway Administration (FHWA), which found that, after controlling for population growth, it has been 92 months since American driving activity increased—an unprecedented trend (Schmitt, Where is the Bottom? Americans Continue to Drive Less and Less, 2013). The FHWA study also noted that this decline in driving activity is not related solely to the price of gas or economic variables, but that long-term factors such as “the growth in telecommuting, the retiring of the baby boom generation, and...a decline in driving among young people” are responsible as well (Schmitt, Where is the Bottom? Americans Continue to Drive Less and Less, 2013). According to the U.S. Public Interest Research Group (PIRG), the decline in driving among young people (16- to 34-year olds) has decreased by nearly 25 percent from 10,300 miles per capita in 2001 to 7,900 miles per capita in 2009 (Schmitt, U.S. PIRG Report: Young Americans Dump Cars for Bikes, Buses, 2012). As both the elderly and total populations grow and the transportation preferences of the nation change, the demand and necessity for the use of intermodal transportation will increase exponentially—along with the need to construct intermodal facilities that are accessible and simple to use.
5.4 Demographics of Curbside Intercity Bus Riders

Interest in alternative forms of transportation, particularly privately owned curbside intercity buses, has been increasing among the Millennial generation. In addition to a decline in driving, more Millennials have begun to favor a “transit lifestyle.” The social influence of curbside intercity bus customers has spurred the popularity of this mode of travel. According to a study conducted by the Chaddick Institute for Metropolitan Development at DePaul University, 73 percent of the passengers on curbside intercity buses are between the ages 18–35 (Fischer and Schwieterman, 2011). Of the survey respondents, approximately 22 percent stated that they were only making the trip because of the availability of the curbside intercity bus service. Nearly 84 percent of respondents mentioned that they were traveling for “pleasure/personal matters” (Fischer and Schwieterman, 2011). The Chaddick Institute links this interest to the “discounted fares [that]...undercut Amtrak fares by more than 25% and commercial airlines by more than 50%,” the benefits afforded by express services, and effective advertising (Fischer and Schwieterman, 2011). Basically, the study shows that curbside buses are filling a niche that remains unfilled by other alternative forms of transportation. Other factors attributed to its popularity among young Millennials include on-board amenities (e.g., Wi-Fi), rising gas and toll prices, convenient online ticketing, and hassle-free travel (Fischer and Schwieterman, 2011).

5.5 Transit-Oriented Development

Transit-oriented development (TOD) is “development located within a quarter- to half-mile radius of a transit station that offers a mix of housing, employment, shopping, and transportation choices within a neighborhood or business district” (Office of Sustainable Communities Smart Growth Program, 2013). The goals of TOD (Shinkle, 2012) are to:

- Increase “location efficiency” to provide multi-modal transportation options.
- Boost transit ridership and minimize traffic.
- Provide a rich mix of housing, shopping, and transportation choices.
- Generate revenue for the public and private sectors.
- Provide value for both new and existing residents.
- Create a sense of place.

While TOD can be a very expensive process due to the costs associated with improving the infrastructure and atmosphere of the targeted area, many positive outcomes can be realized if this development strategy is utilized (Office of Sustainable Communities Smart Growth Program, 2013). TOD can lead to benefits such as increased economic activity, improved mobility for citizens, a healthier environment, and an improvement of the quality of life for the community as a whole, with the positive outcomes being concentrated the most in the neighborhood in which the development is occurring (Office of Sustainable Communities Smart Growth Program, 2013). The positive outcomes associated with TOD are achieved because the utilization of mixed-use planning allows for the creation of a neighborhood that is both a destination for community members and visitors and a home for residents, while also providing individuals with the opportunity to seamlessly travel through the city (Office of Sustainable Communities Smart Growth Program, 2013).
5.6 Placemaking

“Placemaking” is a growing international movement that capitalizes on a local community’s assets, inspiration, and potential, ultimately creating good public space that promotes people’s health, happiness, and well-being. The Project for Public Spaces (PPS) further defines placemaking as “a multi-faceted approach to the planning, design, and management of public spaces” (Project for Public Spaces, n.d.). An intermodal station that reflects the culture and atmosphere of its home city, while also providing numerous amenities to its users, is a key factor in promoting a positive image. Often, a transit center serves as a gateway to a city and will provide a lasting first impression—good or bad.

Creative placemaking is becoming a key strategy in economic development. According to PPS Vice President Ethan Kent, in the modern knowledge-based economy “there’s a realization...that capital and people can go where they like more than ever before.” One of the best ways to attract and retain jobs is to create a vibrant and livable community (Broberg, 2013). PPS states that the four cornerstones to enhancing job creation and economic growth through placemaking are to promote the utilization of “markets and local economies...multi-use public destinations...building community through transportation...and [creating] an architecture of place [that allows community institutions to focus on improving the social and human capital of the area]” (Projects for Public Spaces, 2010). By focusing on these four objectives, a city can create a sense of place that attracts the businesses, talent, and social activity that are necessary to flourish in the modern economy.

PPS notes in its report Putting our Jobs Back in Place that businesses “want places that are attractive to employees, where connections can happen, where productivity and creativity increase, and where the professional networks foster collaboration and innovation” (Projects for Public Spaces, 2010). Of the cities that have effectively utilized the technique of placemaking, all “showcase at least one multi-use destination—an interesting place where people can go for a variety of activities that involve more than shopping. A multi-use destination that is the heart and soul of a community can both create an identity and generate good jobs and economic growth for that city” (Projects for Public Spaces, 2010).

Failure to create a multi-use destination that promotes placemaking can present a competitive disadvantage to companies. Brown Advisory is a financial firm that is located in Baltimore, Maryland. Describing Baltimore’s Penn Station in an interview for the Baltimore Business Journal, the firm’s CEO Michael Hankin states, “It’s disgraceful...When we have visitors, I always find myself apologizing for the condition of that station and saying Baltimore is much better than that experience provides” (Lambert, Business Travelers Rail Against Baltimore’s Penn Station, 2012). Ultimately, the perceived image of a city is an integral aspect of its economic potential. The Urban Land Institute (ULI), asserts that planners should focus on building places, not just projects. It notes that the design of transit centers “[presents] an opportunity...for a full-fledged transit-centered community, with all the attendant economic and cultural benefits” (Dunphy, Myerson & Paulukiewicz, 2003).
5.7 Economic Impact

Drexel University’s study also focused on the economic impact of BoltBus services to the City of Philadelphia. It found that the total net positive impact of this business included $94,236,000 in estimated net revenue for 2011 along with the net creation of 865 new jobs (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012). The top three areas where revenue was positively impacted included lodging ($18,300,000), performing arts ($16,500,000), and retail ($16,300,000). The three areas that received the most positive benefits through job creation included lodging (178 new jobs), retail (159 new jobs), and other attractions (138 new jobs) (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012). The three areas that were negatively impacted the most included Amtrak (-$4,800,000 revenue and 47 jobs lost), NJ Transit (-$1,640,000 revenue and 16 jobs lost), and Septa (-$1,090,000 revenue and 11 jobs lost) (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012).

Drexel University researchers noted that they “believe the impact of the BoltBus service to be extremely positive for the City of Philadelphia and its residents...[and that if neither curbside service existed (BoltBus and Megabus)] the potential lost economic opportunity for the city...could be substantial” (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012). One improvement recommended by a respondent is to position “the buses more closely to the 30th Street Train Station...because it could offer the potential for a sitting area,...more convenience items,...and could even provide a more clear process for the buses” (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012). Ultimately, the services provided by BoltBus have provided an economic stimulus to the City of Philadelphia and, according to at least one respondent, the quality of service and, in turn, utilization of said service could be improved through the integration of these curbside buses into the 30th Street Train Station.
6. Challenges to Intermodal Transportation

6.1 Primary Barriers to Construction of New Facilities

While the expansion of infrastructure necessary for intermodal transportation would benefit the country greatly, certain barriers exist that hinder attempts to construct new facilities that could accommodate multiple modes of transit. According to a 2007 Government Accountability Office (GAO) report, the three primary barriers to the construction of these facilities include “limited federal funding targeted toward intermodal projects...limited collaboration among stakeholders...and limited resources to evaluate intermodal projects” (Government Accountability Office, 2007). For example, of the 26 projects that received credit assistance valued at approximately $9.1 billion (as of April 2012) through the Transportation Infrastructure Finance and Innovation Act (TIFIA), 17 have been focused on highways, five on transit, and four on intermodal projects (Government Accountability Office, 2012).

Issues similar to these were mentioned as barriers to intermodalism at the 1997 North American Intermodal Transportation Summit at the University of Denver. These include the planning processes and lack of cooperation of involved organizations, financial resources along with an unequal distribution of them, “labor and management relations,” and organizational willingness to approach transportation issues from a holistic viewpoint that includes other policy considerations in the decision-making process (Jones Jr. and Turner, 2004). A speech by former U.S. Congressman and Chairman of the House Transportation and Infrastructure Committee James Oberstar cited primary obstacles to expanding intermodalism. Hurdles cited include the “stovepipe” organizational structure of transportation agencies, the competition for funding and customers that exists between modes of transit, the method through which transportation projects are funded, and the cost and scope of the projects themselves (University of Minnesota Center for Transportation Studies, 2003). Ultimately, the primary barriers hindering intermodalism include organizational culture and structure of transportation agencies, political barriers, and financial barriers.

6.2 Barriers to Inclusion of Curbside Intercity Buses into Intermodal Facilities

Barriers that hinder the inclusion of privately owned curbside intercity buses into intermodal facilities are related primarily to the business model that these companies utilize. These are privately owned businesses that are concerned with earning a profit. Because curbside intercity bus companies cut costs by picking up and discharging passengers at easily changed curbside locations, operating from an intermodal facility may not be in their economic best interest due to the costs, such as facility fees. Other obstacles to facility contracts may include increased overhead expenses, decreased decision-making autonomy, and inflexibility to adjust routes based on rider demand. For privately owned curbside intercity buses, it may be more cost-effective to utilize a curbside in an urban setting as a pick-up/drop-off point, in conjunction with online ticketing, because it decreases costs and responds to customer demands for service. New routes can be planned, implemented, and changed in response to customer demands or service demand shifts. Unless measures are in place that incentivize the use of intermodal facilities, or
that regulate the use of the curbside as a pick-up/drop-off point, along with a sufficient demand for the service within the community, it may be difficult to integrate privately owned intercity buses into an intermodal station.

Physical barriers also can impede the inclusion of intercity buses into intermodal facilities. While master planning of intermodal transportation facilities can provide design to incorporate intercity buses, many urban, center-city transit stations were/are constructed to accommodate passenger rail. This focus on rail means that, in some cases, these facilities are not suitable for use by large, often double-decker motorcoach buses. Physical constraints of facilities for these buses include available space, parking restrictions, lack of layover areas, available pick-up/drop-off areas, lack of safe pedestrian facilities, bus ingress/egress configurations, and the size and location of the facility. Upgrading/renovating these facilities to be suitable for intercity buses can be a costly, complicated, and time-consuming endeavor.
7. **Funding Opportunities**

7.1 **Funding Overview**

Acquiring funding for the design and construction of a new or improved intermodal facility can be a very difficult process due to the high costs and complexity of these projects. Intermodal projects are typically long-range, multi-phased endeavors that require the developer to leverage funds from multiple sources—often public and private sources. The needs and interests of various stakeholders, the traveling public, sources of financing, and levels of government also must be considered and carefully balanced.

Funding can be attained through a variety of sources including public-private partnerships, specific federal grant programs/earmarks (e.g., Moving Ahead for Progress in the 21st Century Act [MAP-21], Transportation Investment Generating Economic Recovery [TIGER] grants, and Partnership for Sustainable Communities Programs), the General Services Administration’s Federal Buildings Fund, state and local government funding, and financial support from public transit agencies/authorities. In most cases, federal funding programs require the leveraging of matching funds from a combination of sources such as private investors, state and local government, transit agencies, public-private partnerships, hybrid organizations such as Amtrak, or non-profit organizations. The U.S. Environmental Protection Agency (EPA) Office of Sustainable Communities also has identified several innovative financing options that can be used to leverage traditional financing for TODs. Ultimately, the completion of an intermodal project is dependent upon utilizing a mix of these funding streams and financing strategies.

7.2 **Public-Private Partnerships**

One mechanism that can be utilized to acquire funding for the construction or modification of intermodal facilities is a public-private partnership. According to the National Conference of State Legislatures (NCSL), while many definitions of what constitutes a public-private partnership exist, nearly all of them share “certain key characteristics, such as ultimate public sector responsibility for and ownership of an asset; sharing and allocation of risk among public and private entities; contribution of resources by both public and private partners; a contractual agreement; and transfer to the private sector of traditionally public responsibilities” (Rall, Reed & Farber, 2010). The characteristics of a public-private partnership are primarily shaped by three key components including “the kind of facility or public service that is the focus of the project…the project delivery model…and the source of financing” (Rall, Reed & Farber, 2010). This partnership is a flexible tool that allows the public sector to utilize financing and expertise from the private sector, while still maintaining oversight over the project.

Public-private partnerships are an effective tool to finance transportation-related projects because they can lead to “private financing and project acceleration...[the] monetization of existing assets...cost and time savings...lifecycle efficiencies...improved project quality...risk transfer...[and] public control and accountability” (Rall, Reed & Farber, 2010). The key to maximizing the benefits and reducing the risks associated with public-private partnerships is for the “public sector [to take] a careful and well-informed approach to enabling legislation, project analysis and selection, procurement, contracting, and long-term contract management and
oversight” (Rall, Reed & Farber, 2010). Successfully accomplishing these tasks means that negative consequences associated with issues such as “loss of public control and flexibility…private profits at the public’s expense…loss of future public revenues…rise of bankruptcy or default…[lack of] accountability and transparency…environmental issues…labor concerns…[involvement of] foreign companies…toll road controversies…and specific contract terms” can be mitigated (Rall, Reed & Farber, 2010).

While public-private partnerships can lead to the successful construction of transportation infrastructure, they must be used in conjunction with other financing strategies to be effective. It is estimated that they would only be appropriate for approximately 20 percent of projects in this field (Rall, Reed & Farber, 2010). Another important thing to note is that while this model can provide more options for project delivery and financing in the long run, it does not provide new money to fund the project. Traditional methods still must be used to pay for it eventually (Rall, Reed & Farber, 2010). Ultimately, the success of a public-private partnership is dependent on proper planning, cooperation, and the selection of appropriate projects for this funding mechanism.

### 7.3 Moving Ahead for Progress in the 21st Century (MAP-21)

Moving Ahead for Progress in the 21st Century, which was signed into law on July 6, 2012, provides approximately $105 billion for surface transportation for the fiscal years 2013 and 2014 (Federal Highway Administration, 2012). The primary goals of MAP-21 are to promote “safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays” (Federal Highway Administration, 2012). One of the ways that these goals can be achieved is through the integration of privately owned intercity buses into the nation’s transportation network with the use of intermodal facilities. Financial assistance is available from MAP-21 that could be used for this purpose through several programs including the Transportation Infrastructure Finance and Innovation Act (TIFIA), the Transportation Alternatives Program (TAP), the Enhanced Mobility of Seniors and Individuals with Disabilities, Congestion Mitigation and Air Quality Improvement (CMAQ), Transit Oriented Development Planning, and the Surface Transportation Program (STP) (Federal Highway Administration, 2012). While characteristics such as the cost, location, applicant, and modal focus of a project will determine its eligibility for each of these programs, all still are potential sources of financial assistance for intermodal construction or expansion (Federal Highway Administration, 2012).

### 7.4 General Services Administration Funding

Funding for intermodal projects also is available through the General Services Administration’s Federal Buildings Fund. The Federal Buildings Fund provides financing opportunities for projects that will lead to the construction of new federal facilities or the upgrading or repurposing of federally owned buildings or property. Lisa Wild, a senior project manager with the GSA explains that while the funding available through this source is not enough to support projects independently, properties that have fallen into disrepair can be modified to increase their utility to the public if it is used in conjunction with state, local, and community support (Nyren, 2013). Wild describes a project in Colorado in which 65 acres of unused federal land at
the Denver Federal Center was sold to the City of Lakewood for the purposes of constructing a new community hospital and intermodal transit center. This new facility now provides services to the Denver Federal Center, which employs more than 6,000 individuals (Nyren, 2013). Through this partnership an intermodal station was created on unused land that, in turn, provided benefits to the community as a whole. The key to acquiring funding from this source is to align local and regional interests with federal goals.

7.5 Transportation Investment Generating Economic Recovery (TIGER) Grants

The TIGER Discretionary Grants program, which was appropriated $473.847 million by the Fiscal Year 2013 Appropriations Act, is designed to provide funding on a competitive basis to surface transportation infrastructure projects that will have a significant positive impact on the country, a region, or a metropolitan area (U.S. Department of Transportation, 2013). These grants range in value from $10 million to $200 million, although rural areas can receive funding as low as $1 million (U.S. Department of Transportation, 2013). The TIGER grant, and any other federally funded sources, can cover up to 80 percent of the costs of the project (this restriction is removed for rural areas), although applications that show alternative funding streams in place will receive a competitive advantage (U.S. Department of Transportation, 2013).

Over the history of the TIGER grant program, selected projects, on average, have provided four non-federal dollars for every dollar awarded by the TIGER program (U.S. Department of Transportation, 2013). Projects are selected based on six primary criteria, which align with the goals of the DOT Strategic Plan for the fiscal years of 2012-2016. These include “state of good repair...economic competitiveness...livability...environmental sustainability...safety...[and] project readiness (defined as technical and financial feasibility, a detailed project schedule, and an assessment of project risks and mitigation strategies)” (U.S. Department of Transportation, 2013). Consideration also is given to factors such as “innovation...partnership...jurisdictional and stakeholder collaboration...and disciplinary integration” (U.S. Department of Transportation, 2013). Ultimately, the TIGER Discretionary Grants program can be a valuable source of funding for the construction or expansion of intermodal facilities if a strong argument can be made for the positive benefits that the project’s completion would have on the region or country as a whole.

7.6 Partnership for Sustainable Community Grants

Under the Livability Initiative, federal programs—such as the Interagency Partnership for Sustainable Communities—have been developed to help the country develop in more environmentally and economically sustainable ways. An interagency partnership was formed among the USDOT, Department of Housing and Urban Development (HUD), and EPA to foster sustainable communities, strategies, and techniques that will increase transportation options, promote affordable housing, lower transportation costs, and enhance economic competitiveness while protecting the environment (Partnership for Sustainable Communities, n.d.).

Each of the three agencies that form this partnership provides grant opportunities to communities that are implementing projects that align with the six livability principles. In
general, DOT grants focus on supporting projects that will help to create “livable, walkable communities.” EPA offers funding that “support activities that improve the quality of development and protect human health and the environment.” HUD offers “funding opportunities to help communities realize their own visions for more livable, walkable, and environmentally sustainable communities” (Partnership for Sustainable Communities, n.d.). While specific grants meeting these criteria are offered periodically, each of these agencies also has funding programs devoted to financing projects that will lead to sustainable, livable communities.

7.7 Innovative TOD Financing

According to the EPA report *Infrastructure Financing Options for Transit-Oriented Development*, the financing tools that are used to fund TOD can be organized into seven separate groups. These include direct fees, debt tools, credit assistance, equity, value capture, grants, and emerging tools such as structured funds, land banks, redfields to greenfields, and a national infrastructure bank (Office of Sustainable Communities Smart Growth Program, 2013). Studies show that TOD can be a catalyst for local economic development, infill development, and urban renewal. Because TOD tends to increase property values near transit stations and leads to land speculation, strategies to capture and reinvest this value have been considered.

The term “value capture” has been described “as a mechanism by which all or a portion of the financial benefits received through property value increases, generated by geographically targeted public capital investments, are appropriated by a local public authority” (Gihring, 2009). One value-capture method suggested is a tax on land values. To achieve this, a “local improvement district” is created and a special assessment, or land value tax, is levied to pay for costs of station improvements, public infrastructure, and other amenities that enhance the attractiveness of the transit station and stimulate adjacent mixed-use development (Gihring, 2009). Ideally, a land value tax could help to promote TOD, encourage new private investment in mixed-use and transit-oriented communities, and raise revenue to finance public improvements. Other value-capture techniques can include the use of development fees and joint development (Office of Sustainable Communities Smart Growth Program, 2013).
8. Case Study: Washington, D.C.’s Union Station

8.1 Background

Designed by famed Chicago architect Daniel Burnham, Union Station in Washington, D.C., opened as a rail station in 1907. To preserve the historic structure, which had fallen into disrepair, Congress passed the Union Station Redevelopment Law in 1981. The law created the privately owned, non-profit Union Station Redevelopment Corporation (USRC). The U.S. Congress and the U.S. Department of Transportation (USDOT) have charged USRC to maintain and enhance Union Station as an intermodal and destination-oriented transportation center (Union Station Redevelopment Corporation, n.d.). USRC’s governing board consists of five members including the U.S. Secretary of Transportation, who serves as the board chairperson; the President and CEO of Amtrak, who serves as the board vice-chair; the Mayor of the District of Columbia (D.C.); and the Federal Railroad Administrator (Union Station Redevelopment Corporation, n.d.).

In 2011, the USDOT reported that each day the station hosts more than 100,000 passengers (U.S. Department of Transportation, 2011). Union Station now serves as a multi-modal transportation hub for Amtrak, the Washington Metropolitan Area Transit Authority (WMATA) regional rail and bus lines (i.e., Metrorail and Metrobus), intercity buses, Virginia Railway Express (VRE), Maryland Area Regional commuter (MARC), D.C. Street Car, and the D.C. Circulator. As a major retail/entertainment center, it serves as a walkable destination and grand public space in the heart of the District of Columbia for residents, commuters, and visitors. USRC has secured public-private partnerships and leveraged funds to begin the long-term transformation of Union Station into a full-fledged intermodal transportation facility that is integrated with TOD.

8.2 Short-Term Strategies to Accommodate Intercity Buses

As the curbside intercity bus industry began expanding within the Northeast Corridor (NEC) beginning in 2008, the District of Columbia government began to seek ways to manage the growing demand for the new service along with the high volume of other motorcoach operations, including charter/tour, commuter, sightseeing, and shuttle bus services.

8.2.1 Rulemaking

To address the challenges of motorcoach parking, routing, curbside stop locations, and enforcement of regulations, the District Department of Transportation (DDOT) issued a notice of proposed rulemaking for intercity buses on June 25, 2010. A second notice of proposed rulemaking was made on March 11, 2011, and legislation to amend Title 24 “Public Space and Safety” of the District Code of Municipal Regulations was adopted on June 24, 2011 (District of Columbia Department of Transportation, 2011). The regulations require intercity bus operators to apply for and obtain a public space permit, pay an annual permit fee, display the permit when occupying a passenger loading zone during approved hours, obtain a public liability insurance policy, and pay fines for ordinance violations (District of Columbia Department of Transportation, 2011).
8.2.2  Motorcoach Action Plan

DDOT also worked with stakeholders to develop the Motorcoach Action Plan in December 2011. The plan provided intermediate-, mid-, and long-term strategies slated for completion by 2015 (District of Columbia Department of Transportation, 2011). A long-term recommendation of the Motorcoach Action Plan was to “develop a centralized intermodal facility focusing on future development in areas along key corridors in the District” (District of Columbia Department of Transportation, 2011).

8.2.3  Union Station Bus Deck Improvements

To implement the Action Plan recommendations, USRC and the District government launched a six-month pilot program in January 2010 that allowed several intercity bus carriers to depart from Union Station. Under the pilot program, BoltBus, DC2NY, and Washington Deluxe began offering service from the Union Station Parking Garage Bus Deck to New York City.

On May 6, 2010, USRC issued an RFP to conduct an intercity-bus-facility-capacity study to design and construct a 10,000-square-foot intercity bus terminal in the Union Station Parking Garage. The intent of the study was to assess bus capacity within the parking garage, internal bus traffic flow, and bus access to adjacent streets to “determine the number of intercity buses that can be accommodated/parked at one time while ensuring safe vehicle operation and pedestrian safety” (Union Station Redevelopment Corporation, 2010). The study included the analysis of and recommendations for:

- Safe flow of movement of passengers, including peak times and seasons, for boarding and disembarking buses and walking between the terminal area and Union Station.
- Capacity of the bus deck and bus traffic flow based on ridership projections, assessment of future demand, schedules, and timetables for intercity bus carriers.
- Safe flow of movement of vehicles/taxis, vehicle parking capacity, and design of drop-off and pick-up areas based on projected growth (Union Station Redevelopment Corporation, 2010).

Union Station Bus Deck improvements were completed in June 2013. Now bus passengers are able to safely board and disembark from buses at the sheltered Union Station Bus Deck, transfer or change to other modes of transportation, and patronize on-site commercial and retail businesses. The new Union Station Bus Deck pavilion has signage, vending, restrooms, and a security station with personnel. USRC issued an RFP in May 2013 to contract for long-term operation of the intercity bus terminal retail pavilion.
8.2.4 Intercity Bus Relocation Agreement

In April 2011, following DDOT’s decision to regulate intercity bus operators, the U.S. Secretary of Transportation tasked USRC with creating a plan to incorporate curbside intercity bus operations into Union Station. USRC was given 90 days to develop a plan with a bus deck design that accommodated double-decker buses, met the Americans with Disabilities Act of 1990 (ADA) standards, provided a financial plan, and allowed an onsite alternative for tour bus parking (Scott, Wicks & Collins, Curbside Intercity Bus Transportation Policy Forum: Forum Proceedings Summary, 2012).

Based on the success of the pilot program, USRC reached an agreement on August 1, 2011—with popular intercity bus carriers Greyhound, Bolt Bus, Washington Deluxe, and Megabus—to relocate their services from curbside areas to Union Station. According to a USDOT news release, “The intercity bus relocation agreement is one of several projects that will continue to position Union Station as a cutting-edge, multi-modal transportation hub and unique retail destination” (U.S. Department of Transportation, 2011). In the release, U.S. Deputy Secretary of Transportation and Chairman of the USRC John Porcari stated, “By moving intercity buses to Union Station, we can increase tourism, provide more transportation options to D.C. residents, and help keep bus drivers rested and ready for the road. This is a win for bus companies, a win for Union Station, and a win for the residents of the District” (U.S. Department of Transportation, 2011).

As a result of USRC’s agreement with intercity bus carriers, more than 70 percent of intercity bus service in the District is now centralized at Union Station; bus traffic and congestion has been reduced on city streets. As of June 29, 2011, there were 23 intercity bus slips available at the Union Station Bus Deck, allowing for 126 average daily departures and 125 average daily
arrivals and servicing 3.3 million annual inbound and outbound passengers from the facility (Scott, Wicks & Collins, Curbside Intercity Bus Transportation Policy Forum: Forum Proceedings Summary, 2012). In addition to Bolt Bus, Washington Deluxe, DC2NY, and Megabus, Greyhound also began operating out of the Union Station Bus Deck.

8.2.5 Financial Plan
A financial plan was developed to manage operating costs and finance capital expenditures of the bus deck facility. These capital improvements included on-site amenities such as information kiosks, ticket facilities, and waiting rooms. An offsite parking lot for bus drivers with an area for refreshments and restrooms also was developed by USRC in partnership with DDOT and the D.C. Mayor’s Office (U.S. Department of Transportation, 2011). To provide revenue to support operating and capital budget costs, USRC established a per-slip fee of $2,500 per month and a fee of $0.75 per passenger for bus trips originating or ending in Union Station (Thomson, 2011). According to USRC officials, an additional 2.5 million annual passengers has been generated as a result of the Union Station bus-terminal improvements (Nzinga Baker, personal communication, 2013).

8.3 Long-Term Strategies to Accommodate Intercity Buses

8.3.1 Union Station Intermodal Transportation Center Feasibility Study
The District of Columbia Department of Transportation (DDOT) initiated a Union Station Intermodal Transportation Center Feasibility Study (USITCS) in 2008. With an extensive outreach process and participation from a diverse group of stakeholders, DDOT conducted a comprehensive assessment of facility improvement (District of Columbia Department of Transportation, 2009) by evaluating several factors, including:

- Growth of Union Station’s usage across all modes.
- Needs of various Union Station stakeholders (including rail operators, pedestrians, intercity buses, tour buses, and streetcar services).
- Emergency evacuation concerns.
- Plans for mixed-use development as well as the potential growth of commercial and/or residential development in adjacent areas.

To guide the feasibility study, DDOT established planning framework goals (i.e., multimodal hub, pedestrian environment, safety and security, cultural significance) and concurrent planning principles.

Stakeholder input was garnered via agency meetings, public workshops and presentations, committee meetings, a telephone hotline, website, and design charrette. After an extensive planning period, a matrix was developed that sets forth a plan for improvement in relation to framework goals. An implementation timeframe identified improvements that can be phased in both on a short-term (2–10 year) and long-term (10–20 year) basis (District of Columbia Department of Transportation, 2009).
<table>
<thead>
<tr>
<th>Planning Framework Goals</th>
<th>Planning Principles</th>
</tr>
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<tbody>
<tr>
<td>Maintain and enhance Union Station as a multi-modal transportation hub.</td>
<td>Transportation First</td>
</tr>
<tr>
<td></td>
<td>Connectivity</td>
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<tr>
<td>Promote Union Station as a fluid pedestrian environment that supports comprehensive</td>
<td>Pedestrian Priority</td>
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<td>connectivity.</td>
<td>Signage</td>
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<tr>
<td>Ensure enhanced safety and security in and around the station.</td>
<td>Safety and Security</td>
</tr>
<tr>
<td>Respect the architectural, cultural, and regional significance of the historic station.</td>
<td>Heritage Preservation</td>
</tr>
<tr>
<td></td>
<td>Neighborhood Integration</td>
</tr>
</tbody>
</table>

**USITCS Planning Framework**
(District of Columbia Department of Transportation, 2009)
8.3.2 Union Station Master Plan

Intercity bus deck improvements are part of the overall plan to revitalize Union Station. Master planning for Union Station is an ongoing and collaborative process. In addition to Amtrak, stakeholders involved in Union Station visioning and master planning include USRC, USDOT, Maryland Transit Administration, Virginia Department of Rail and Public Transportation, the Washington Metropolitan Area Transit Authority, and other public and private entities. Amtrak released its revised *Union Station Master Plan* in 2012, developed with HOK and Parsons Brinkerhoff, to transform the facility into a dynamic intermodal center with enhanced retail activity. “The power of the Master Plan lies in its ability to create a high-functioning and well-integrated multimodal transportation hub, as well as a wonderful new urban neighborhood—all within a relatively confined space” (Parsons Brinckerhoff; Helmuth, Obata, and Kassabum, 2012).
The Master Plan provides a long-term blueprint for growth and improvements that may be accomplished incrementally through phased construction over a 15- to 20-year period. In addition to intercity bus deck improvements, current Master Plan initiatives underway include upgrades to the pedestrian circulation system and the 1st Street Metro entrance as well as redevelopment of the adjacent Columbus Plaza (Union Station Redevelopment Corporation, 2012). Facility improvements also will enhance transportation services and connections among the various modes—including a new streetcar service to the H Street corridor, increased commuter and intercity rail service, and future expansion of high-speed rail within the NEC. Long-term improvements will triple passenger capacity, double train service, improve the passenger and visitor experience, and provide transit-oriented development and economic growth to the area by 2030 (Parsons Brinckerhoff; Helmuth, Obata, and Kassabum, 2012).

Transit-oriented, smart-growth development also is a cornerstone of the Union Station Master Plan. Burnham Place is envisioned as a major commercial, retail, and residential hub that will serve as a mixed-used development anchor to Union Station. Burnham Place’s developer, Akridge, has purchased the station’s air rights. It has released tentative plans that call for 1.5 million square feet of office space, more than 1,300 residential units, 500 hotel rooms, and 100,000 square feet of retail space. Development of Burnham Place will capitalize on Union Station’s appeal as a historic landmark and tourist destination. It will transform an existing rail yard, create an elevated greenway as a gateway, and provide new connections for pedestrians and bicyclists (Akridge, n.d.).

The phased-construction approach enables investments to be tied to available resources, demand for services, and ability to leverage funds. Cost estimates for the phased-in station reconstruction and terminal capacity expansion are between $6.5 and $7.5 billion in 2012 dollars. The Master Plan with plans for Burnham Place is expected to generate $14.3 billion in economic benefit to the D.C. Metropolitan area over the next 15 years (Parsons Brinckerhoff; Helmuth, Obata, and Kassabum, 2012).
9. Case Study: Intermodal Plans for Baltimore, Maryland

9.1 Background
Baltimore has recognized the importance of transportation in revitalizing the economy of the former industrial city and its heritage as a strategically located East Coast port. The City of Baltimore’s transportation goal is to “improve rapid and reliable regional transit to link diverse neighborhoods, job centers, educational centers, and cultural/entertainment and tourist destinations” (City of Baltimore, 2008). To achieve this goal, state, regional, and local transportation plans support transit-oriented development, major transportation system capacity improvements, investments in transportation facilities and local redevelopment opportunities, and multi-modal transportation options responsible growth and economic development.

In addition to the use of automobiles, transportation options in Baltimore currently include:

- Maryland Transit Administration (MTA) local bus system with 57 routes.
- MTA light rail system serving Hunt Valley and BWI Marshall Airport, Hunt Valley/Timonium and Cromwell Station/Glen Burnie, and Penn Station and Camden Yards with external connections to locally operated transit systems.
- MTA Metro Subway, a 15.5-mile, 14-station subway system.
- MTA Commuter Bus Service (or bus-rapid transit service) that connects suburban commuters to Baltimore and Washington, D.C., job centers.
- MTA’s Maryland Rail Commuter Service (MARC), which is operated under contract with the National Railroad Passenger Corporation (Amtrak) and CSX Transportation and provides weekday, non-holiday commuter rail service to downtown Baltimore’s Penn Station (via the Penn Line) and Camden Station (via the Camden Line).
- City of Baltimore’s Charm City Circulator shuttle bus fleet of 21 eco-friendly buses that travel along three routes in Baltimore City and link to area transit systems.
- Amtrak intercity passenger rail service and Acela high-speed rail.
- Intercity buses including Greyhound, BoltBus, Megabus, and Eastern/Rockledge.

9.2 Short-Term Strategies to Accommodate Intercity Buses

9.2.1 Local Regulatory Environment
While the City of Baltimore regulates parking and loading zones, there is no specific rulemaking designed to manage intercity bus activities within the city. Article 31 § 6-16 of the Baltimore City Code provides a process to apply, at no cost, for a passenger loading zone defined as “a space adjacent to a curb that during specified times, is reserved exclusively for the use of vehicles that are loading or unloading passengers and their baggage” (Baltimore City Department of Legislative Reference, 2013). Upon approval, the Director of Transportation may determine the location and operational hours of the passenger-loading zone, post signage, and enforce the expeditious loading/unloading of passengers.
9.2.2 **Dispersed Intercity Bus Operations**

Currently, there is a lack of consolidation of intercity bus services; there are several locations of “curbside” operations and a sheltered bus terminal. In addition, intercity bus services lack connectivity to other modes of transportation and continuity of services among regionally and locally operated transit systems.

**Greyhound and Peter Pan Express**, traditional intercity bus carriers that use terminals, operate from the Greyhound Bus Station located at 2110 Haines Street in downtown Baltimore. The bus station provides a sheltered waiting area and restrooms, but lacks parking and other amenities. A new Greyhound Bus Station is planned to replace the current one, which was originally designed as a temporary structure (Lambert, Baltimore Approves Deal for New Greyhound Station Near M&T Bank Stadium, 2012). The City of Baltimore will lease the building for 20 years and voted to spend a $4 million Federal Transportation Administration grant for the station at 2110 Haines Street.

**BoltBus**, a curbside intercity bus company, uses 1610 St. Paul Street as an arrival/departure point, which is only blocks from Baltimore’s Penn Station (BoltBus, 2013). Taxis often clog the bus lane at the St. Paul Street location, which forces buses to idle in the streets. In addition, waiting passengers often sit on residential stoops and leave trash, which creates problems for the residents living in the area. To solve this problem, the City worked with BoltBus officials to negotiate a proposed move to another location. Initially, several sites were proposed that were farther from Penn Station, including some in the Mondawmin neighborhood. However, BoltBus arranged a move to Maryland Avenue, near Penn Station, because the close proximity to transit was important to its business model. To implement the win-win solution, a bus bulb with a shelter will be constructed in a space approximately 50 ft. by 8–10 ft. on the north end of the bridge, which rises above the train track lines extending from Penn Station (Scott, Wicks & Collins, Curbside Intercity Bus Transportation Policy Forum: Forum Proceedings Summary, 2012).

**Megabus**, another curbside intercity carrier, continues to use a suburban Baltimore departure location. The Park ‘N Ride lot at White Marsh Mall, located about 15 miles north of downtown Baltimore off I-95, serves as the arrival/departure point for Megabus services. The company has no plans to relocate into the city.

**“Chinatown”** buses (e.g., Eastern, Rockledge, NYDCExpress) operate from 5501/5400 O’Donnell Street in front of the Baltimore Truck Travel Plaza/Cornerstone Grill and travel to and from Chinatown locations in other cities.

9.2.3 **Multi-Modal Hub(s)**

Baltimore’s light-, commuter-, or heavy-passenger rail lines each independently have the potential to be, or are considered, multi-modal transportation hubs. Yet many of these rail lines appear to be seamless connections to other regional or local transportation systems. The Metro subway system lacks easy connection to the light rail system and has no connectivity to the MARC commuter rail system. There appears to be two on-foot Metro subway–light rail connection points at the State Center/Cultural Center and Lexington Market Stations. Transfer appears to be possible between MARC and the light rail system at two points—Camden Yards and Penn Station.
Amtrak/MARC’s Penn Station is a multi-modal hub located at 1500 North Charles Street on Amtrak’s Northeast Corridor. In addition to passenger rail, Penn Station is serviced by MTA’s Maryland Rail Commuter Service (MARC), MTA’s bus system, the city’s light rail system, and the Charm City Circulator shuttle bus. The Penn Line of the MARC rail service operates primarily between Baltimore’s Penn Station, through BWI Thurgood Marshall Airport Train Station, and Union Station in Washington, D.C.

MARC’s Camden Station operates out of Camden Yards in downtown Baltimore City and provides MARC rail service along the Camden Line to Union Station in Washington, D.C. The station provides transit connections to MTA’s local, express, and commuter bus services.

Other Baltimore destinations that are identified as multi-modal hubs are the State Center/Cultural Center with metro subway service, light rail, and bus connections as well as Charles Center and Johns Hopkins Medical Center with metro subway and bus services.

9.2.4 Transit-Oriented Development as a Transit-Based Economic Growth Strategy

Maryland statute defines TOD as “a dense, mixed-use deliberately planned development within a half-mile of transit stations that is designed to increase transit ridership” (Maryland Department of Transportation, 2013).

As an economic development and transportation planning strategy, Maryland Governor Martin O’Malley has focused on developing areas around Maryland’s transit stations and increasing transit ridership. In June 2010, Governor O’Malley designated 14 transit stations as TOD sites, which enables projects to be eligible for state-agency resources and financing opportunities, prioritization for MDOT transportation funding assistance and predevelopment planning, and top ranking for location of state offices and facilities (Maryland Department of Transportation, 2010).

Baltimore City’s comprehensive plan also has adopted a transit-oriented development (TOD) Strategy as an approach to create compact, pedestrian-friendly destinations, and activity centers near transit stations. The City’s Department of Planning defines TOD as:

…a development approach that encourages intensifying and inter-mixing land uses (residential, office, retail, and entertainment) around transit stations, integrating public amenities (open spaces and landscaping) and improving the quality of walking and bicycling as alternatives to automobile travel. Successful TOD projects also address ways to ensure personal security and safety, encourage economic and community
development, respect the area’s cultural history, and strengthen the connections between transit and surrounding neighborhoods (City of Baltimore, 2010).

The City has partnered with MDOT, MTA, and Baltimore County to forge transit-supportive land use policies, attract new transit ridership, and leverage transit investments to achieve economic development goals. Guiding principles for TOD planning and policy include leveraging transit assets/investments to achieve economic growth, expanding transportation options, encouraging compact mixed-use development near transit centers, and providing neighborhood benefits including enhanced housing choices and placemaking (City of Baltimore, 2009). The City of Baltimore’s transit-based economic growth strategy is built upon five core economic growth areas that are connected by existing and future transit (Department of General Services and Maryland Department of Transportation, 2011).

9.3 Long-Term Intermodal Plans

Baltimore is looking toward high-density, mixed-use, transit-oriented development as a panacea for economic development. While several long-term intermodal plans have been developed, most of the plans are conceptual, need funding, and do not appear to address the need to integrate intercity bus operations with transit center development plans.

9.3.1 Penn Station

As one of the busiest stations on the Northeast Corridor, Amtrak has invested $7 million over the past three years to improve Penn Station’s concourse, lighting, and train information board. An additional $1 million investment is planned in 2013 for restroom upgrades, landscaping, painting, and electronic signage (Mirabella, 2013). In March 2013, Amtrak selected Beatty Development, with the backing of the City, MDOT, the Central Baltimore Partnership, and the Baltimore Development Corporation, to be the master developer of a TOD concept for an area adjacent to Baltimore’s Penn Station. The 1.5-acre parcel currently is a surface parking lot that fronts East Lanvale Street between North Charles and St. Paul Streets. The master plan calls for 1.5 million square feet of mixed-used development, which will cost over $500 million over the next decade, and complement the Charles North Vision Plan that will reinvigorate the entire Charles Street corridor (Mirabella, 2013).

Stephen Gardner, Amtrak’s Vice President of Northeast Corridor Infrastructure and Investment Development, stated to the Baltimore Sun, “…Amtrak and our partners are focused on developing a viable plan for Baltimore Penn Station that incorporates the growing transportation needs of the region and creates dynamic and vibrant development opportunities that will benefit the community as a whole” (Mirabella, 2013). The project will serve as a gateway and one of the four anchors to the Station North Arts and Entertainment District, which will provide urban regeneration to a multi-ethnic neighborhood. In addition to optimizing the neighborhood for TOD, the conceptual plan calls for developers to make the area a vital and pedestrian-oriented place, protect the historic character of the neighborhood, provide a visual and physical linkage to Penn Station, and attract private investment and urban revitalization (Amtrak, 2011).

Baltimore City’s largest employer, Johns Hopkins University (JHU), also is working with city
officials, businesses, the Central Baltimore Partnership, and the Greater Homewood Community Corporation to infuse investment and redevelopment of the area between Penn Station and its Homewood campus area. JHU has invested $1 million toward a new fund that will offer low- or no-interest loans to private and non-profit developers that invest in the Homewood area. The goal is to bring 3,000 families to ten neighborhoods within ten years, bolster the Station North Arts and Entertainment District, and complement other development projects such as the Amtrak initiative (Dash, 2013).

9.3.2 State Center TOD
The “State Center” complex is a large concentration of state government offices located in mid-town Baltimore City’s Cultural Arts area. The 28-acre campus borders Preston Street and the State Center/Cultural Center Metro Station and is across the street from the Cultural Center light rail station.

Maryland’s Department of General Services (DGS), MDOT, and the Maryland Department of Planning (MDP), began planning for the redevelopment of the property in 2004. Other champions that have supported redevelopment of the State Center include the Maryland Economic Development Commission, the Maryland Governor’s Office, the City of Baltimore, and other local governments. The draft State Center Transit-Oriented Development Strategy provides a framework for disposition of state-owned properties and promotion of TOD in the corridor between Penn Station and Pennsylvania Avenue. The project also will utilize a network
of streets and bolster transit linkages between the MTA Metro subway and MTA light rail systems to reconnect nine neighborhoods.

The Strategy sets forth a vision to enhance the existing cultural and educational institutions of the Cultural Center and diversify the area as the city’s most attractive arts, entertainment, retail, and residential district. This newly vibrant area would serve to reconnect and reenergize some of the city’s most diverse and historically significant communities and resources.

Stated goals of the project are to “reconnect the 28-acre campus with surrounding neighborhoods, renovate and replace [s]tate office buildings with highly efficient and sustainable office space, and create a dynamic mixed-use environment that will include residences, offices, commercial spaces, street-level retail, and public spaces” (Department of General Services and Maryland Department of Transportation, 2011). Additional objectives (Maryland Department of Transportation, n.d.) are to:

- Develop financially viable projects using private-sector funding sources.
- Create new revenue sources for the public sector.
- Increase Metro and light-rail ridership.
- Expand state and local property, sales, and income tax base.
- Provide a mix of housing for a broad range of incomes, including working families and others of very low, low, and moderate incomes.
- Implement TOD principles.

An economic impact report states that the initial phase of State Center TOD redevelopment will provide 515,000 square feet of state offices, 15,000 square feet of new private office space, and 55,000 square feet of new retail. Benefits include 180 new jobs (1,800 construction-related), annual Baltimore City revenues of $2.7 million, and one-time tax revenues of $7.4 million. True TOD, mixed-use development will be realized in future phases that will bring an additional 2.4 million square feet of commercial space and 1,356 residences over a 15-plus-year period (Bay Area Urban Economics, 2011). These phases will bring $12.8 million annually in revenues to Baltimore City and $39.3 million in one-time revenues from transfer taxes and recordation fees (Bay Area Urban Economics, 2011).

Unfortunately, funding has been a major obstacle to implementation of the State Center Transit-Oriented Development Strategy and other TOD projects. FHWA states that implementing and funding TOD is challenging due to “the unconventional and more complex nature of mixed-use developments and urban locations.” According to a case study published by FHWA, noted challenges to TOD (Federal Highway Administration, 2013) include:

- Limited funds for TOD.
- Obstacles to providing adequate parking to support transit and surrounding development.
- Need for more flexibility with tax increment financing (TIF) and other funding options.

To address these obstacles, MDOT has taken the lead to initiate plans for land development, partner with other public and private entities, and craft policy changes to implement TOD. To
accomplish this, MDOT (Federal Highway Administration, 2013):

- Established the Office of Real Estate to get MDOT-owned properties ready for sale and private development.
- Spearheaded the drafting of adopted legislation that allows state transportation funds to be used for TOD facilities.
- Pushed for the adoption of legislation that allows more flexibility for TIF funds to support maintenance and operational needs of TOD facilities.
- Supported “Sustainable Communities” legislation, signed into law in 2010, which strengthens reinvestment and revitalization in Maryland’s older communities, establishes a new transportation focus to investments and community revitalization, and enhanced an existing rehabilitation tax credit into a Sustainable Communities Tax Credit program.

While funding has been problematic, another obstacle is strong public opposition to State Center TOD master plans. Media coverage indicates that landlords and business community members fear the proposed project will negatively impact local business establishments and require taxpayer subsidies—including $80 million in tax increment financing—to fund the project. In December 2010, business leaders filed a lawsuit to block the development, claiming the state violated procurement laws. In January 2013, a judge ruled in favor of the business leaders, voided the development agreements between the state and a private developer, and deemed the State had violated state procurement laws (Baltimore Brew, 2013). As of summer 2013, project implementation has stalled.
10. Case Study: Newark, Delaware Regional Transportation Center

10.1 Background

The Newark Train Station in Newark, Delaware, provides Amtrak intercity passenger rail service, Acela high-speed rail services, and Southeastern Pennsylvania Transportation Authority (SEPTA) commuter rail services, which is under contract by the Delaware Transit Corporation (DTC) and operates under the name of DART First State. In FY 2012, the station provided transportation for approximately 14,682 passengers and earned $943,407 in ticket revenue (Amtrak, 2013). Septa’s FY 2011 Annual Service Plan reports that the R2 Line, which runs from Newark, Delaware, to Philadelphia, Pennsylvania, averaged 9,274 passengers and 2,541,095 riders annually (Southeastern Pennsylvania Transportation Authority Service Planning, 2011).

While sufficient parking and a connecting service through DART is available, amenities such as an enclosed waiting area, restrooms, ticketing booth, lounge, and Wi-Fi are not (Southeastern Pennsylvania Transportation Authority, 2013 and Amtrak, 2013). Commuter rail services between Newark and Philadelphia also are limited to weekday travel with only early-morning and late-afternoon arrival/departures. On weekdays, there is an average of 332 passengers boarding and 280 passengers alighting at the Newark Train Station. Due to an increase in demand for services, the 20-mile commuter gap, a lack of commuter rail service that exists between Newark, Delaware, and Perryville, Maryland, and a railroad bottleneck that limits freight transport due to an insufficient amount of tracks at the station, improvements are planned in the future (Scott, DeCoursey, Franzen, Dworsky & O’Donnell, 2009 and Wilmington Area Planning Council, 2010).

A DART First State bus shelter, located on South College Avenue, is adjacent to the Newark Train Station and provides transit connections for rail passengers. However, a Newark Transit Hub was constructed in 2008 on East Main Street and was designed to serve as a boarding, alighting, and transfer point for DART First State bus riders and former Newark trolley riders. It is convenient to Newark’s downtown business district and has on-site parking and a sheltered waiting area.

10.2 Short-Term Strategies to Accommodate Intercity Buses

Currently, curbside intercity buses (i.e., Megabus and Greyhound Express) offer premium non-stop service to major East Coast destinations from a stop on Christiana Drive in Newark at a north-campus parking lot owned by the University of Delaware (UD). Other than parking, which is owned by UD, there are no accommodations provided to the patrons of intercity buses at this location. The parking lot is approximately 1.5 miles away from the Amtrak/SEPTA station, which is located on South College Avenue.

10.3 Long-Term Strategy to Accommodate Intercity Buses

In FY 2010, the Wilmington Area Planning Council (WILMAPCO) applied for and received a USDOT Transportation Investment Generating Economic Recovery, or TIGER II Discretionary
Planning Grant. A large number of agencies collaborated on the grant application, including the Delaware Department of Transportation, University of Delaware, Delaware Transit Corporation, New Castle County, City of Newark, Delaware Economic Development Office, and Norfolk Southern Railroad Corporation. The TIGER II grant provided $2.25 million toward a total project cost of $3.025 million for the design of a proposed multi-modal transportation facility in Newark, Delaware. Funding will transform the current Newark Train Station into a “Newark Regional Transportation Center” on a site formerly occupied by the Chrysler automotive plant that is now owned by the University of Delaware. The TIGER II funds were used to develop a preliminary plan for transit-oriented services in and around the Newark Rail Station. The plan focused on transportation solutions to support economic development, accessible housing, and multi-modal transportation choices for the area surrounding UD’s Science, Technology and Advanced Research (STAR) campus (U.S. Department of Transportation, n.d.).

As a follow-up to the TIGER planning grant, WILMAPCO submitted and was awarded a $10 million TIGER IV capital grant in FY 2012 to construct the Newark Regional Transportation Center. The total project cost is expected to be $26 million. The balance of project costs (61.5 percent) will be financed through funds provided by both public and private partnerships (U.S. Department of Transportation, 2012).

The Newark Regional Transportation Center is being constructed to align with the six livability principles of the USDOT, and, ultimately, it is expected to lead to more transportation choices, affordable housing, an increase in the area’s economic competitiveness, and the creation of new TOD opportunities as well as bolster UD’s vision to transform the site to a science and technology campus (Wilmington Area Planning Council, 2010). UD’s Star campus will host a Bloom Energy manufacturing facility, health sciences complex, and mixed-use development (Krape, 2012).

The multi-modal facility also is significant to the entire Northeast Corridor. It is expected to enhance SEPTA/MARC commuter rail service and lead to the closing of the 20-mile commuter rail gap, expand future Amtrak rail service, provide an alternative to automobile travel via I-95, and offer seamless national and regional rail connections. As an intermodal hub, the facility ideally should be designed to facilitate greater coordination of UD transportation services, DART First State bus routes, taxi services, and intercity bus services with accessible facilities for both pedestrians and bicyclists (Wilmington Area Planning Council, 2010).
Plans for Newark Regional Transportation Center
(Krape, 2012)

11.1 Background

Philadelphia’s neo-classical 30th Street Station, which was constructed between 1929 and 1933, is listed on the National Register of Historic Places and now owned by Amtrak (Amtrak, 2013). The station is one of the busiest intercity passenger railroad facilities along the Northeast Corridor (NEC) and in the United States. With extensive local and regional passenger volume, the station hosts an estimated 4 million annual riders who generated $265 million in ticket revenue annually in FY 2012 (Amtrak, 2013). The station is within walking distance to historic West Philadelphia and University City, which is home to some of the nation’s top hospitals, research facilities, and higher-education institutions.

Amtrak operates from the lower-level platform and provides both intercity passenger rail service and high-speed Acela service from 30th Street Station, which serves as a multi-modal hub. SEPTA and New Jersey Transit provide regional passenger rail service (NJTransit). The station serves as one of SEPTA’s three primary regional rail hubs and provides service via 13 regional rail lines—including one to the Philadelphia International Airport and one to Delaware via its Wilmington/Newark Line. NJTransit also uses 30th Street Station as the terminus for its Atlantic City Line. Connections to SEPTA’s Market-Frankford subway line and subway-surface trolley system are a short walk away from the station’s entrance. The station is within walking distance and is served by the SEPTA city bus, SEPTA suburban bus, University City Bus loop, LUCY Bus, and intercity buses.

Cira Center, a 28-story office tower, was developed on land leased by Amtrak and connects to 30th Street Station by a mezzanine-level skyway. In November 2013, Amtrak will complete a $30 million project that includes a redesign of the west station entrance to enhance pedestrian circulation, vehicular flow, security lighting, and public parking (Fisher, 2013). The Pennsylvania Department of Transportation (PennDOT) is simultaneously rehabilitating six bridges over Amtrak’s Northeast Corridor rail lines, fortifying base structures, conducting roadway improvements, and installing automated-voice pedestrian-crossing signals at nearby intersections.

11.2 Short-Term Strategies to Accommodate Intercity Buses

The Philadelphia Greyhound Terminal is located on Filbert Street in Center City Philadelphia, immediately north of The Gallery at Market East shopping mall and the SEPTA Market East Station. The terminal underwent interior renovations in 2007, offers an array of passenger amenities, and in 2010 was the sixth-busiest terminal in the United States and Canada, based on passenger volume (Greyhound, 2013). While budget intercity bus operators used Philadelphia’s Chinatown as a curbside location, newer low-cost, premium intercity bus services arrived in Philadelphia in 2008. As in other areas of the country, corporate carriers like BoltBus and Megabus have challenged Greyhound’s market share.

- Passengers traveling in 2011 on the BoltBus Philly to NYC route totaled 575,000; 600,000 passengers were expected in 2012.
- Ridership achieves 85–90 percent capacity.
- An average price of $12 per ticket with a 20 percent profit margin.
- Most online tickets (97 percent) are sold to students, young adults, and commuters.
- Employment of 23 people based in Philadelphia.

11.2.1 Municipal Curb Space Regulation

The City of Philadelphia has corralled intercity and tour buses into specialized centers for bus parking (Zalewski, Buckley & Weinberger, 2011). The site behind 30th Street Station on the 3100 block of John F. Kennedy Boulevard (JFK Boulevard), where BoltBus and Megabus operate, has one space for departures and two arrival spaces. In addition, the City has limited arrivals and departures to three per hour. It removed nine metered spots for the JFK Boulevard drop-off/pick-up point. Currently, the City has a total of five dedicated spaces. To secure these spaces for bus use, the operator must replace meter revenue, which amounts to $25,000 per year for three spaces (Scott, Wicks & Collins, Curbside Intercity Bus Transportation Policy Forum: Forum Proceedings Summary, 2012). Chinatown buses have a different curbside location with two curbside spaces to board and alight passengers. The curbside location is adjacent to the Greyhound Station near Race Street and 11th Street in Chinatown.

11.2.2 Economic Impact Analysis

Corporate intercity buses have faced some challenges from various groups in the City of Philadelphia. Among those advocating against the providers of this service are Drexel University, Amtrak, and the University City District (UCD), a private, non-profit organization comprised of higher-education “anchor institutions,” small businesses, and residents (University City District, n.d.). The primary complaint against curbside intercity buses operating adjacent to 30th Street Station is that these corporate carriers use public curb space for profit, take advantage of passenger amenities within 30th Street Station, and do not contribute economically to the City of Philadelphia.

To address these claims, BoltBus asked Drexel’s LeBow School of Business to conduct an Economic Impact Study in 2011. The study measured the overall impact of BoltBus’ curbside intercity bus service on the City of Philadelphia in terms of economic development, environmental impact, transport mode shifts, quality of life, and tax contributions. The Economic Impact Analysis (EIA) concluded that BoltBus operations in the City of Philadelphia provide a positive impact to the local economy and community. Total impact of BoltBus service in 2011 by beneficiary/benefactor was estimated to be $94 million. Positive impacts came from taxes paid to the City of Philadelphia and out-of-pocket spending by BoltBus passengers (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012).

As a result of this study, the City agreed to allow corporate intercity bus companies to operate in the area behind 30th Street Station without paying curbside user fees. The City recognizes the
importance of this new mode of transportation and, as a result, will likely feature greater accommodations for them in future plans for the station (Antolin, Chen, Pandya, Sharma, Yu & Long, 2012). In the short term, 30th Street Station has added signage to direct rail passengers to the JFK Boulevard exit, where the buses can arrive and depart. The signage directs users to BoltBus, Megabus, LUCY Bus, and the University City Bus Line.

11.2.3 Placemaking
University City District (UCD) is a partnership consisting of higher-education and research anchor institutions, small businesses, and residents to improve economic vitality and quality of life in the University City area of West Philadelphia (University City District, n.d.). Working in conjunction with the Mayor’s Office of Transportation and Utilities, UCD has embarked on placemaking as a primary economic development and community revitalization strategy. UCD capitalized on Amtrak’s recent infrastructure improvements and redesign of the west station to convert the 30th Street Station’s street-level, west plaza into a transformative, open space called “The Porch.” UCD had PennDOT convert the asphalt roadway along 30th Street’s south side into a 50-foot-wide concrete pad and, with support from a major foundation, added amenities such as café tables with umbrellas, vibrant seasonal planters, and green walls to screen construction and scheduled special events and performances (Gates, 2013). The Porch is regarded as a “marquee” public space because its location outside 30th Street Station has helped to make the area a destination, a vibrant anchor for the area, and a place where pedestrians and multi-modal transportation users (e.g., curbside intercity bus passengers) can sit, grab a bite to eat, or be entertained before making travel connections.

11.3 Long-Term Intermodal Transportation Strategies

11.3.1 Intermodal Hub as a Key to Drexel University Innovation Neighborhood Plans
As part of its 2012–2017 strategic plan, Drexel University has set forth a campus master plan that includes a vision for Drexel to anchor a vibrant “Innovation Neighborhood” in University City. Drexel University envisions bringing together education and research institutions, the commercial sector, and entrepreneurs in a partnership to spur development that is centered around the 30th Street Station transportation hub (Drexel University, 2013).
In December 2012, the Pennsylvania General Assembly approved an expansion of the Innovation Neighborhood’s designation as a Commonwealth of Pennsylvania Keystone Opportunity Zone (KOZ). As an economic development strategy, KOZs offer incentives to develop targeted sites through greatly reduced or eliminated state and local taxes (Pennsylvania Department of Revenue, 2013). The Central Philadelphia Development Corporation prepared a Real Estate Development Plan for the Innovation Neighborhood. The preliminary strategy calls for developing ten sites and 6.4 million buildable square feet from 30th to 32nd Streets, and Market Street to JFK Boulevard. The strategy outlines the existing conditions of the sites, the potential economic impact of the development, financing incentives, prospective corporate and developer partners, and recommendations for the next phase of planning. According to the Real Estate Development Plan, the ultimate goal of the comprehensive redevelopment of the superblock area around the 30th Street Station is “establishing a lively, mixed-use, multi-purpose district featuring academic, residential, retail, commercial, and technology-incubation use” (Central Philadelphia Development Corporation, 2013).

Drexel University also hopes to forge real estate partnerships with Amtrak and SEPTA. Plans call for potentially extending the mixed-use campus district into the adjacent railroad yards and conducting long-term development of 50 acres in the Penn Coach Yards section of the Amtrak property (Central Philadelphia Development Corporation, 2013). An economic and fiscal analysis of the Innovation Neighborhood plan was conducted, and it was estimated that initial construction will provide a one-time economic impact of $2.8 billion for Philadelphia and $4.3 billion for Pennsylvania, an annual operational economic impact of $2.2 billion for the City and $3.2 billion for the state, and long-term (80-year) impact of $14.5 billion for the City, $4.6 billion for the Philadelphia School District, and $23.5 billion for the state.

As of July 2013, Drexel is moving ahead with plans to transform more than 12 acres of underutilized land, adjacent to 30th Street Station, into a mixed-use, transit-oriented development community that will provide a gateway to Philadelphia and enable Drexel to anchor the Innovation Neighborhood (Drexel University, 2013). In addition to KOZ financing, other sources of funding include the state’s Redevelopment Assistance Capital Program, U.S. Immigration Investor Program (EB-5 Program) funding of Philadelphia’s “Welcome Fund,” the U.S. Department of Housing and Urban Development’s (HUD) Section 108 Loan Guarantee Program, U.S. Treasury’s New Markets Tax Credit Program, and tax-exempt debt (Central Philadelphia Development Corporation, 2013).

11.3.2 Amtrak’s Plan for Philadelphia’s Market East Station as Intermodal Hub

In July 2012, Amtrak released its Vision for the Northeast Corridor: 2012 Update. The update combines two major planning initiatives released in 2010—The Northeast Corridor Infrastructure Master Plan and A Vision For High-Speed Rail in the Northeast Corridor (2010 HSR Vision)—into one document. It provides a timeline for key projects that will be incrementally phased in over the next 30 years to provide rolling-stock, existing-corridor, infrastructure, and high-speed service improvements within the NEC from Washington, D.C., to Boston, Massachusetts (Amtrak, 2012).
Since the release of the 2010 HSR Vision, Amtrak has refined the NEC Next Generation High-Speed Rail (NextGen HSR) alignment, which would begin in Washington, D.C., and end in Boston, Massachusetts, for a total length of 438 miles (Amtrak, 2012). The new configuration, consisting of two dedicated, grade-separated tracks, will have implications for Philadelphia’s intermodal hub. Amtrak envisions a new HSR, Market East Station east of Philadelphia’s City Hall, linked by a 10-mile tunnel to Philadelphia International Airport, where a second new station would be built. If the realignment is implemented as proposed, Philadelphia’s historic 30th Street Station—and current intermodal hub—would be relegated as a hub for slower intercity trains and commuter service (Nussbaum, 2012).

The new HSR alignment beneath Center City Philadelphia would enable bullet trains to travel up to 220 m.p.h., avoid slow curves, address space limits near 30th Street Station, and achieve 37-minute train trips to New York City by 2040. Planners estimate a cost of $3 billion for a new station in Center City, another new station at Philadelphia International Airport, and a 10- to 12-mile tunnel linking the two and continuing north of Center City (Nussbaum, 2012). In addition to train speed, Amtrak’s proposed alignment and selection of “super express” service to hub stations in Washington, D.C., Philadelphia, New York, and Boston is based on local transit connectivity. It states, “connections to regional rail, light rail, bus and auto facilities have an important impact on the ridership and the eventual success of the program” (Amtrak, 2012). While plans for intercity bus providers are not specifically mentioned, and it is unlikely that Amtrak would advocate for connectivity to its corporate curbside intercity bus competitors, it makes sense for plans for connectivity among intermodal transportation to include intercity buses.

Philadelphia advocates and opponents have weighed in on Amtrak’s vision for Market East Station to replace 30th Street Station as the city’s intermodal hub. Mayor Nutter’s administration supports Market East Station as an intermodal hub as it aligns with the Philadelphia Market Street East Strategic Plan, adopted in July 2009. The goals of the plan are to restore Market Street’s role as the city’s “Main Street,” achieve maximum density, promote mixed-use development, and create an expanded intermodal transit center at the Market East Station (Philadelphia City Planning Commission, 2009). A new Market East station beneath SEPTA’s
existing station, between 10th and 11th Streets, is hoped to boost redevelopment between City Hall and the waterfront area on the Delaware River.

The Delaware Valley Association of Rail Passengers (DVARP) believes that the 30th Street Station should not be ruled out as a contender for bullet trains. DVARP wants the Federal Railroad Administration (FRA) to analyze existing and new alignment options to make an informed decision. Advocates of 30th Street Station believe it can be reconfigured as a high-speed hub at a fraction of the $3 billion estimated cost for constructing a new station and tunnels (Nussbaum, 2012).

The total proposed infrastructure and high-speed service improvements to the NEC over the next 30 years are estimated at $151 billion. Financing would come from fare and on-board concession revenues, access revenue fees, real estate revenues, private investment, and federal, state, and local government funding (Amtrak, 2012). By mid-2015, FRA will release a comprehensive plan and select its preferred alternative alignment for the corridor.
12. Case Study: New York City Proposed Intermodal Upgrades

12.1 Background

New York City hosts several major intermodal facilities that provide direct connections between various modes of transportation and serve to discourage travel by automobiles. However, the city’s dense and congested environment coupled with the recent explosion and growth of the intercity bus industry have presented challenges to both transportation policy and infrastructure.

Intercity buses and commuter buses historically have used the Port Authority Bus Terminal (PABT), operated by the Port Authority of New York and New Jersey (PANYNJ). Located in Midtown Manhattan on 42nd Street, between 8th and 9th Avenues near the Theater District, it is the nation’s busiest and largest bus terminal. PABT opened in the 1950s in an effort to consolidate all bus activity into a single efficient terminal, keep a proliferation of buses off the streets, and remove waiting passengers from congested sidewalks (Scott, Wicks & Collins, Curbside Intercity Bus Transportation Policy Forum: Forum Proceedings Summary, 2012). To accommodate growth, PABT has undergone several major renovations in its 63-year history and relies on payments from bus carriers to maintain the facility. It currently serves 8,000 buses and 225,000 travelers daily.

Since the curbside intercity bus industry emerged on the travel scene in New York City some 15 years ago, it now represents the majority of intercity bus arrival/departures within the city. According to a graphic prepared by PANYNJ, as of 2010, intercity bus carriers arrive/depart from three primary locations—the PABT, Midtown curbside locations, and Chinatown district locations (Scott, Wicks & Collins, Curbside Intercity Bus Transportation Policy Forum: Forum Proceedings Summary, 2012).
Map Prepared by PANYNJ Shows Two Pink Highlighted Areas that Represent New York City “Intercity Bus Hot Spots”

According to PANYNJ, Chinatown curbside locations in lower Manhattan and Midtown Manhattan curbside locations that are primarily used by BoltBus and Megabus. The blue dot within Midtown Manhattan represents the location of PABT. About 75 percent of intercity buses in New York City use the curbside arrival/departure points in Midtown and Lower Manhattan; about 25 percent use PABT (Scott, Wicks & Collins, Curbside Intercity Bus Transportation Policy Forum: Forum Proceedings Summary, 2012).

12.2 Short-Term Strategies to Accommodate Intercity Buses

12.2.1 Intercity Bus Curbside Operation Pressures Facilities
The steady growth of the new intercity bus industry has caused operational pressures at both the curbside locations in Lower and Midtown Manhattan and at PABT. A local business improvement district, called the 34th Street Partnership, has exerted pressure on the City to relocate curbside intercity bus stops to less crowded blocks west of Penn Station. To ease congestion at Midtown curbside pick-up and departure points, BoltBus cut Midtown service by 30 percent and relocated single-decker buses to PABT in 2012 to “work with the City of New York’s Department of Transportation (NYC DOT) to help ease congestion at its curbside locations” (BoltBus, 2011).
However, PABT is now at capacity and cannot accommodate Megabus’ double-decker buses. Moreover, price may be a factor in weeding out smaller, non-corporate intercity bus companies from using PABT. A bus slip at the PABT costs roughly $40 per departure, $6,500 for an annual platform, and an additional $13,000 to $19,000 for use of the station gate (Beck, 2010).

NYC DOT was criticized for allowing Megabus to operate on the street outside PABT without paying fees, while competitors like BoltBus pay a steep price. On August 1, 2012, Megabus departures in New York City moved to 34th Street between 11th and 12th Avenues. The 34th Street stop is located across the street from the Javits Center, a convention center, which is located three blocks west of Penn Station.

12.2.2 Rulemaking
The City regulates the curbside intercity bus industry indirectly through the enforcement of existing ordinances and regulations. New York City’s Police Department, Department of Environmental Protection, and Department of Consumer Affairs enforce existing ordinances that govern parking, idling, and loading and unloading (New York City Department of City Planning: Transportation Division, 2009).

In 2012, the New York State Assembly passed a law pertaining to New York City that authorized the NYC DOT to develop a permitting system for curbside usage by intercity buses (New York State Legislature, 2011). This system has not been fully implemented, but is expected to help alleviate curbside and traffic congestion and ensure greater intercity bus industry accountability. The new system allows New York City to designate streets and locations for passenger loading and unloading of intercity buses. Charter and tour buses are specifically exempt from the legislation.

This law establishes a city agency to be responsible for reviewing, approving, and disbursing permits to designate locations for curbside drop-off. It also will establish bus company identification rules and require operators to submit information about their operations for approval. The permitting system is expected to help manage the demand for scarce curbside bus spaces, particularly those loading and unloading near Penn Station. The legislation also includes a provision to require input from the public, local community boards, and the Metropolitan Transportation Authority before bus stop locations are designated. Online posting of approved bus applications and intercity bus stops would allow for continual feedback from the public and other stakeholders.

As of spring 2013, proposed rules drawn up by NYC DOT would grandfather or provide a three-year grace period to existing curbside intercity bus operators. Under the NYC DOT proposal, bus operators would be charged a yearly fee based on their number of weekly pick-ups and drop-offs. A series of public workshops were being held to solicit public opinions on the proposed system. This resolution is a result of recognizing the need to organize the influx of buses into local communities, provide public input on intercity bus stop locations, and manage curb space.

In addition to NYC DOT’s curbside management rules, a municipal law also was enacted by the New York City Council on June 6, 2013, which requires the NYC DOT to post a link on its website to information about passenger carrier safety (New York City Council, 2013). The
legislation is designed to make prospective intercity bus passengers better-informed consumers prior to purchasing a bus ticket. The law requires bus passengers to receive a Federal Motor Carrier Safety Administration (FMCSA) “pre-trip safety poster” at the point of ticket purchase or prior to boarding a bus.

12.3 Long-Term Strategies to Accommodate Curbside Intercity Buses

12.3.1 Proposed Port Authority Bus Terminal Expansion

In 2013, PANYNJ issued a request for proposals from firms to develop a Midtown Bus Master Plan. Its $5.5 million, 18-month contract was awarded in June 2013 to architecture firm Kohn Pedersen Fox and construction consultants Parsons Brinkerhoff. The Midtown Bus Master Plan will study the feasibility of renovating or possibly replacing PABT, explore a state-of-good-repair investment program, and consider new bus staging and storage facilities on Manhattan’s West Side. The goal is to address the growing demands for intercity bus services, improve bus operations, provide facilities and upgraded amenities for intercity bus passengers and commuters, and limit buses idling on city streets. The study also will explore options for developing the bus terminal’s air rights (The Port Authority of New York and New Jersey, 2013).

In a press release issued by PANYNJ, Chairman David Samson stated, “The development of a Master Plan underscores the Port Authority’s commitment to make the Bus Terminal a world-class facility and bus transit the most reliable mode of access to Midtown Manhattan. While the Port Authority has already begun the work of revitalizing the Bus Terminal...this comprehensive approach is the best way to ensure the Bus Terminal keeps pace with future passenger growth over the next fifty years” (The Port Authority of New York and New Jersey, 2013).

The Midtown Bus Master Plan will demonstrate that PABT may serve as a centerpiece of economic activity and will complement the redevelopment and revitalization of west Manhattan. An upgraded and modernized bus terminal will support the demand for intercity bus and commuter travel between New York City and New Jersey. As with any major transportation infrastructure improvement or facility expansion project, securing funding has been problematic. In the past decade, PANYNJ has made several unsuccessful attempts to expand the terminal and upgrade its capacity by trying to establish public-private partnerships, lease air rights, and increase tolls. The Midtown Bus Master Plan will develop a sustainable funding strategy that leverages private-sector investment and considers a fair-share funding strategy from terminal occupants and passenger bus carriers. This strategy will include the development of air rights above PABT to generate revenues for phased-in improvements to the facility (Neuhauser, 2013).

12.3.2 Plans to Address Penn Station Capacity Constraints

The Pennsylvania Railroad originally constructed New York City’s Penn Station in the Beaux-Arts style between 1905 and 1910. In 1963, Penn Station was demolished and reconstructed to serve as a transit facility, Madison Square Garden sports/entertainment venue, and office tower. Reopened as a state-of-the-art transit facility in 1968, it was designed to accommodate 200,000 passengers daily. Penn Station serves Amtrak, the Long Island Rail Road, New Jersey Transit,
and several New York City subway lines. Sitting below an aging Madison Square Garden, Penn Station is now an outdated, crowded, dirty, and unattractive facility that is unable to accommodate the over 650,000 commuters and visitors who use the facility daily. The station also fails to conform to certain building/fire codes and safety regulations.

**Moynihan Station** — To address capacity needs, the late U.S. Senator Daniel Patrick Moynihan proposed in the late 1990s that the Farley Post Office, spanning an entire city block from 8th Avenue to 9th Avenue and running along West 31st to West 33rd Streets, be converted into a rail facility (Mann, 2013). In 2006, the Municipal Art Society (MAS), Regional Plan Association (RPA), the New York Landmarks Conservancy, General Contractors Association, Manhattan Community Board, and other advocates joined forces to create the Friends of Moynihan Center (FMC).

Current plans call for the conversion of the James A. Farley Post Office building, across Eighth Avenue from Penn Station, into what is to be renamed Moynihan Station. Initially, Madison Square Garden had considered moving to the Farley Center along with Amtrak. When it became evident that Madison Square Garden had no plans to move from its current location at Penn Station, FMC moved forward to initiate a three-phased development plan. Of the $270 million estimated costs, Moynihan Station received $83 million in Recovery Act funds to New York through the U.S. Department of Transportation’s “Transportation Initiatives Generating Economic Recovery” (TIGER) program. The first phase of the project will span 2010–2016 and is now underway. This phase will provide new entrances to Penn Station through the Farley building, a wider and longer West End Concourse, more escalators from the platforms, and other infrastructure work (Michaelson, Moynihan Station Phase One Breaks Ground, 2010).
The project’s second, yet unfunded, phase will result in Amtrak relocating its main passenger facility from Penn Station to Moynihan Station. Moynihan Station also will serve as an anchor for high-speed rail travel on the Northeast Corridor and is critical to handling projected ridership increases. However, while Amtrak is slated to relocate to the new Moynihan Station, other major regional rail providers—the Long Island Rail Road and New Jersey Transit (NJTransit)—will not. In addition, the new Moynihan Station will not comprehensively address needs for additional transit capacity, connectivity, and convenience to commuters and intercity travelers. In 2011, Amtrak posted record losses, suffered federal funding cuts, and lost a bid to receive $50 million in federal grant funding for Phase 2 of the Moynihan Station project. A lack of funding could jeopardize Amtrak’s move and its high-speed rail plans at Moynihan Station.

**Demands for a New Penn Station** — Because a new Moynihan Station will not accommodate regional rail providers and address capacity needs, there is growing demand for a new Penn Station. However, envisioning an improved Penn Station, while Madison Square Garden sits atop it, has proved to be problematic.

**The Alliance for a New Penn Station** — This a consortium of civic groups, business leaders, and individuals who believe it is vital to New York’s future to renovate Penn Station as a 21st century transportation hub and relocate Madison Square Garden to provide a top-tier sports and entertainment arena in Manhattan. Two major members of the Alliance—the Municipal Art Society (MAS) and Regional Plan Association (RPA)—have pushed for political and financial support to transform Penn Station into a major economic development anchor for Midtown.

When the owners of Madison Square Garden requested a lease in perpetuity, the Alliance urged local elected officials to grant a restricted lease period, create a comprehensive plan for economic development and transit in West Midtown, and create a Penn Station Redevelopment and Revenue Capture District as proposed by MAS.

MAS issued a request for proposals asking four of New York’s most well-known and respected design firms to re-envision New York’s Penn Station and Madison Square Garden in a design challenge. On May 29, 2013, the design firms presented their visions for a new station and new arena. Designers provided a series of schematic drawings for a new station that would accommodate high-speed rail, increase commuter rail service, improve visual aesthetics by opening the station up to light and air, enhance pedestrian circulation and transit connections, and incorporate high-end retail and commercial establishments (The Municipal Art Society of New York, 2013).

In July 2013, MAS issued a report called *Unlocking Penn’s Potential, Establishing a Penn Station Redevelopment and Revenue Capture District*. The report explored the concept of creating a special finance district to incentivize the relocation of Madison Square Garden, construct a new Penn Station, and continue transportation enhancements at Moynihan Station. The district would serve to leverage additional financial support from the federal, state, and local government, ticket revenue, special assessments, and other sources of funding. The report incorporates conceptual renderings submitted by the four design firms. With inspiration from NYC’s 2005 Hudson Yards plan, the report recommends the “upzoning” of the district to allow greater overall density and a wider mix of uses, provide for a transfer of surplus or unused
development rights from the Farley Building and Madison Square Garden, and “capture revenue” to fund a portion of the capital costs needed to improve both the Penn and Moynihan Stations (The Municipal Art Society of New York, 2013).

Alliance for a New Penn Station proponents called it a “victory” when on July 24, 2013, the New York City Council voted to grant Madison Square Garden a limited 10-year permit to remain in its current location above Penn Station (The Municipal Art Society of New York, 2013). An article on RPA’s website states, “This historic decision paves the way for New York to find a new home for the Garden in Manhattan and to remake Penn Station into a world-class transit hub” (Regional Plan Association, 2013).

Amtrak’s Gateway Project and Other Development Projects – Demands on Penn Station will continue to increase with proposed development projects and Amtrak’s Northeast Corridor investment plans. In 2005, the City of New York established the Hudson Yards Development Corporation (HYDC) to develop the city’s Hudson Yards located at West 42nd and 43rd Streets, 7th and 8th Avenues, West 28th and 30th Streets, and Hudson River Park. In collaboration with New York City, the Metropolitan Transportation Authority, and New York State, HYDC is planning to transform the Hudson Yards area into a vibrant, pedestrian-friendly, transit-oriented, mixed-use district. Success of the project hinges on development of the new Moynihan Center, redevelopment of Penn Station, and nearby complementary projects such as the High Line Park built on an elevated former rail line, the Hudson River waterfront redevelopment project, and possibly the redevelopment of the Javits Center site (Hudson Yards Development Corporation, 2013).
Amtrak’s “Gateway Project” marks the first step toward high-speed rail. The Gateway Project compensates for a failed “Access to the Region’s Core” (ARC) plan, which was supposed to double rail capacity between New Jersey and Midtown. New Jersey Governor Chris Christie nixed the tunnel project due to cost overruns shortly after it was unveiled in 2011. Preliminary engineering and design for two new rail tunnels from New Jersey to New York City comes with a $50 million cost. The new tunnels would significantly increase commuter train capacity by allowing NJTransit to add an additional 13 trains per peak hour into New York City, and it would increase the number of Amtrak trains into New York City by eight per hour (Amtrak, 2011).

In addition, construction of a new “Penn South” station is proposed for completion by 2020. It will be located on privately held land on the block south of the current Penn Station, between West 30th and 31st Streets and between 8th and 9th Avenues. Construction of the Penn South station and a high-rise building would likely result in the razing of an entire midtown block. While Congress approved an initial $15 million for Gateway in November 2011, an additional $20 million is needed (Hawkins, 2012).
13. Case Study: South Station, Boston, Massachusetts

13.1 Background

The five-story, neo-classical revival-style South Station in Boston was constructed as a union station rail facility in 1899 and is listed on the National Register of Historic Places. Owned and operated by the Massachusetts Bay Transportation Authority (MBTA), the station’s original 28 rail tracks have been reduced to only 13 tracks and demand now exceeds capacity (Amtrak, 2013).

Located on Atlantic Avenue in the city’s financial district, South Station is Amtrak’s sixth busiest station in the nation—1.4 million passengers traveled through the facility in FY 2012 (Amtrak, 2012). South Station hosts Amtrak’s high-speed intercity passenger rail (HSIPR), which includes Amtrak’s Northeast Regional and Acela Express services. It also serves as the terminus for Amtrak’s Lake Shore Limited service between Chicago to Boston via Albany (Massachusetts Department of Transportation, 2013).

In addition to hosting Amtrak, South Station also is Boston’s busiest multi-modal transportation hub. As the fifth largest commuter rail system in the nation, South Station serves as the terminus for MBTA’s western and southern commuter rail lines. South Station provides connections to two of MBTA’s four “rapid-transit” subway lines, including the Red Line and the Silver Line to Logan International Airport (Massachusetts Department of Transportation, 2013).

Adjacent to South Station on Atlantic Avenue is MBTA’s South Station bus terminal, which was constructed in the 1990s. The bus terminal is a hub for local MBTA buses as well as private regional and intercity buses. It serves over 16,000 bus terminal passengers daily and about 28,000 additional weekday subway, bus transit passengers, and intercity buses—including curbside intercity bus companies (Massachusetts Department of Transportation, 2013).

13.2 Short-term Strategies to Accommodate Intercity Buses

Because parking is scarce and comes with premium pricing, steps have been taken to control curbside parking in Boston. In most areas, however, curbside on-street parking is unregulated. Some districts use parking meters to regulate parking or various parking regulations to address specific uses (e.g., tour bus parking, loading zones, public transit).

13.2.1 Parking and Traffic Enforcement

In the mid-2000s, Boston and other major cities in the mid-Atlantic region began to experience the impacts of the growth in the curbside intercity bus industry. The Chinatown section of Boston, within a half-mile of South Station, became a popular destination for non-corporate “Chinatown” buses that transport passengers between the Asian districts of major cities. Nearby property owners and residents complained about increased congestion and negative impacts to the district. The City of Boston garnered support from residents and the Chinatown Civic Association and stepped up parking and traffic enforcement. During the seven-month period from March to September 2004, former Chinatown operator Fung Wah received ticketing of $11,000 by the City of Boston (New York City Department of City Planning: Transportation
Divison, 2009). To evade enforcement action and ticketing, Chinatown buses frequently changed arrival and departure times and locations. During this period, traditional corporate intercity bus carriers like Peter Pan and Greyhound, which operated out of the South Station bus terminal, complained that the Chinatown buses were gaining a competitive advantage by avoiding terminal fees by operating curbside. Peter Pan filed a suit with the City of Boston claiming that the Chinatown bus companies were improperly licensed as tour operators rather than intercity bus companies (Steven Squibb, personal communication, June 20, 2013). The City of Boston worked with Chinatown bus companies to find an equitable and mutually beneficial solution to all parties (Squibb, 2013).

In 2004, all curbside intercity buses operating within Boston’s Chinatown district were ordered by the MBTA and the Massachusetts Highway Department to comply with an existing city ordinance that prohibits curbside loading of buses. All curbside intercity bus operations were consolidated at the South Station bus terminal. While there were no open berths at the South Station bus terminal, city enforcement activities incentivized curbside bus companies to operate out of the facility (Thomas Kadzis, personal communication, June 20, 2013). Although the terminal was operating at capacity, Greyhound and Peter Pan agreed to give up unused berths to accommodate the Chinatown buses.

Megabus, a subsidiary of the Stagecoach Group, and BoltBus, a partnership between Peter Pan and Greyhound, expanded to the Northeast in 2008. These new corporate bus companies, and others, immediately began using Boston’s South Station bus terminal and never operated from curbside locations in Boston as they do in most major cities. The bus terminal has ten intercity bus operators with 29 bus berths that account for over 100,000 departures annually and 12,000–15,000 passengers daily (Squibb, 2013).

### 13.3 Longer-Term Strategies to Accommodate Intercity Buses

#### 13.3.1 Planned South Station Expansion (SSX)

In FY 2010, the Massachusetts Department of Transportation (MassDOT) launched a $43 million plan to expand Boston’s South Station. With a match of $10.5 million, MassDOT received a $32.5 million High-Speed Intercity Passenger Rail (HSIPR) grant from the USDOT. Funds were awarded to plan for the design of a larger station and facilities that will relieve MBTA commuter rail congestion, increase the number of platform tracks from 13 to 20, and advance the federal vision for a national network of high-speed rail in the Northeast Corridor. Specifically, the South Station Expansion (SSX) project is consistent with goals to target investments to support future economic growth and environmental and energy goals, as identified in the Northeast Corridor Infrastructure Master Plan (The NEC Master Plan Working Group, 2010).

#### 13.3.2 Transportation and Economic Benefits of South Station Expansion

The SSX project will provide transportation and economic development benefits. In 2007, MBTA, Boston Redevelopment Authority (BRA), and Hines Interests, a privately owned developer, signed an agreement for multi-use air rights for private development over South Station. Hines had proposed a 40-story skyscraper over South Station, expansion of the bus
terminal, and mixed-use construction consisting of a hotel, condominiums, and offices. At a projected cost of $500 million, Hines won City of Boston zoning approval in 2006, an EPA sustainable design award in 2006, and a Boston Green Business Award in 2008 (Hines, n.d.). While the project is still listed on the Hines website, the economic downturn derailed the project’s construction timetable, and the project never commenced.

In 2009, the Commonwealth of Massachusetts passed legislation to establish a special public-private partnership infrastructure oversight commission to leverage private funding support for public infrastructure projects. The commission is charged with providing comment and approval on all state requests for design-build-finance-operate-maintain or design-build-operate-maintain infrastructure proposals (The Commonwealth of Massachusetts, 2013). The commission was not activated until 2013 when MassDOT began exploring public-private partnership opportunities for major transportation construction projects.

Following the 2010 HSIPR grant award, MassDOT began a multi-year preliminary design and environmental review process for SSX in collaboration with the Federal Railroad Administration, MBTA, Amtrak, the City of Boston, and other stakeholders.

In July 2013, MassDOT hosted a public-private partnership commission meeting to explore joint development opportunities around and over the expanded South Station. The agency shared its vision for the SSX project concept as “a vibrant neighborhood, anchored by a multimodal transportation facility that harmonizes old and new” (Public Private Partnership Commission, 2013).

In March 2013, MassDOT submitted an Environmental Notification Form (ENF) to the state of Massachusetts (Massachusetts Department of Transportation, 2013), which describes five key project elements:

- Expansion of the South Station terminal facilities.
- Acquisition and demolition of the U.S. Postal Service (USPS) general distribution facility located adjacent to South Station on Dorchester Avenue.
- Extension of the Boston Harborwalk along a reopened Dorchester Avenue.
- Provision for the opportunity for future public/private development adjacent to and over an expanded South Station.
- Provision for adequate rail-vehicle layover areas for both intercity and commuter rail services.
As part of the environmental review process, four SSX terminal alternatives (Massachusetts Department of Transportation, 2013) were identified:

- **No-Build Alternative** – Serves as the baseline for comparing other project alternatives. This option proposes no changes to current complex, but would allow future air-rights construction over South Station.
- **Alternative 1** – Allows for transportation improvements to provide SSX onto the adjacent USPS property, future air-rights construction, and rail-layover facilities. This scenario would provide an expanded transit concourse and office space, construction of new tracks and platforms, and extension of the Harborwalk along a reopened and restored Dorchester Avenue to improve access for pedestrians and bicyclists.
- **Alternative 2** – Provides for all components of Alternative 1 along with future joint/private development of up to $850,000 of mixed-use space of up to 12 stories and 470 parking spaces.
- **Alternative 3** – Provides for all components of Alternative 1 plus a maximum joint/private development of $2.5 million of mixed-use space of up to 26 stories and 1,370 parking spaces.

Not only is SSX being promoted as an enhanced transportation facility but also for its potential as a private development opportunity that will serve as a catalyst for future transit-oriented redevelopment. Regarded as Boston’s transportation hub and envisioned as a gateway to adjacent neighborhoods, South Station planning and design will provide improvements to better accommodate pedestrians and bicyclists. Because the rail station and bus terminal are adjacent
facilities, connectivity between and among modes is paramount. Joint development calls for “a range of community-supporting uses (retail, restaurants, housing, and hotel).” Washington, D.C.’s Union Station—which has accommodated curbside intercity bus carriers into design, management, and operating plans—is considered a model for development. MassDOT’s project management consultant team is using advanced technology to simulate transportation impacts and “design systems to accommodate multiple modes of transportation and street alterations” (Knapschaefer, 2013). Stakeholder input is being considered during the project’s planning, environmental review, and preliminary design stages. It remains to be seen whether curbside intercity bus operations are regarded as a complementary or competing transportation mode during the planning and design phase.
14. Conclusion

14.1 Attributes Affecting Intermodal Transportation Facilities

The following matrix is based on a review of case studies of major intermodal transportation facilities in the Northeast Corridor from Washington, D.C., to Boston, Massachusetts, conducted by IPA’s research team. These attributes include:

1. **Availability of Funding Sources and Financing Strategies** – Public and private entities/partnerships are able to leverage resources to package financing structures for facility-related improvements, capital investment projects, and/or transit-oriented development.

2. **Cooperation among Stakeholders** – The lead organization(s) is/are committed to engaging a diverse group of stakeholders that represent a wide range of interests. Planning processes are inclusive and strive for consensus building and cooperation among stakeholders.

3. **Project Champions and Public Support** – The project has visible and vocal support from leaders at the national, state, and local levels that work to build agreement and a unified project vision.

4. **Area is Viewed as a Destination** – The area is viewed as an activity-oriented destination that offers opportunities for social interaction and attractions such as dining, shopping, and entertainment.

5. **Transportation Modes Supported** – The facility supports and serves as a hub for every mode of ground transportation in the region. To support the primary function of an intermodal facility, connections among travel modes need to be integrated to provide efficient and effortless interchange of passengers.

6. **Facility Benefits Region** – Not only does the facility serve as a regional transportation hub for multiple modes of transportation, it also provides economic and community livability benefits.

7. **Accessibility** – On-site and external facility and built environment features promote access, mobility, and circulation for all pedestrians—including persons with disabilities.

8. **Available Amenities** – The facility is designed to accommodate all modes, promote ease of mode transferring, help way finding, enhance safety and security, and provide amenities for passengers, visitors, commuters, and residents.

9. **Proximity to a Central Business District (CBD) or Activity Center that Embraces Mixed-Use Development** – Near major employment, commerce, and activity centers, transit-supportive land use around the transit facility is planned to boost ridership through mixed-use and high-density development.

10. **Atmosphere of the Facility** – As a destination in its own right, the facility serves as a vibrant intermodal and commercial center.
IPA’s research team established three rating criteria for each of the ten attributes to determine the potential for an intermodal transportation facility to successfully integrate all modes of transportation—including curbside intercity buses. The rating criteria below may be used to assess the extent to which each of the ten key attributes supports an intermodal transportation facility:

- Highly supportive of intermodal facilities.
- Somewhat supportive of intermodal facilities.
- Not supportive of intermodal facilities.

### Attributes Affecting Intermodal Facilities

<table>
<thead>
<tr>
<th>Attributes Affecting Intermodal Facilities</th>
<th>Highly Supportive of Intermodal Facilities</th>
<th>Somewhat Supportive of Intermodal Facilities</th>
<th>Not Supportive of Intermodal Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Availability of Funding Sources and Financing Strategies</strong></td>
<td>Project is eligible for funding from federal, state, and local governments along with private and non-profit organizations. Multiple financing strategies are also available.</td>
<td>Project is eligible for funding from federal and state governments along with private and non-profit organizations. Financing strategies are limited.</td>
<td>Funding sources and financing strategies are limited to the point where completion of the project is highly questionable or nonexistent.</td>
</tr>
<tr>
<td><strong>Cooperation among Stakeholders</strong></td>
<td>The vast majority of stakeholders agree on the size, scope, and location of the project. Garnering support and funding for it will not be difficult.</td>
<td>A majority of stakeholders agree on the size, scope, and location of the project, but there are notable opponents.</td>
<td>Few stakeholders can agree on the size, scope, or location of the project. There also may be multiple projects in consideration that are competing for funding.</td>
</tr>
<tr>
<td><strong>Project Champions and Public Support</strong></td>
<td>Project has the support of identifiable national, state, and local champions along with community, private, and nonprofit leaders. Public opinion for the project is favorable.</td>
<td>Project has the support of state and local officials along with a few community, private, and nonprofit leaders. Public opinion is inconsistent.</td>
<td>Project is supported by few public officials or community, private, or nonprofit leaders. Public opinion is unfavorable.</td>
</tr>
<tr>
<td><strong>Location Is Viewed as a Destination</strong></td>
<td>Location is a commuter and tourist hub. The demand for transit is strong.</td>
<td>Location has some attractive features, but the majority of individuals do not view it as a destination.</td>
<td>Location is only visited out of necessity. Negative attributes are associated with the location (e.g., safety and security issues).</td>
</tr>
</tbody>
</table>
### Attributes Affecting Intermodal Facilities

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</thead>
<tbody>
<tr>
<td><strong>Transportation Modes Supported</strong></td>
<td>Multiple modes of transportation (national rail, commuter rail, public bus transit, private intercity buses, taxis, car-share, walking, and biking) will be supported. Service will be reliable, and transitions will be safe and seamless. Parking is available.</td>
<td>Multiple modes of transportation (rail, bus, walking) will be supported and service will be reliable but may lack connectivity. Does not consider private modes of transportation. Parking may be problematic.</td>
<td>Few modes of transportation will be supported and service will be unreliable and not coordinated.</td>
</tr>
<tr>
<td><strong>Benefits of Facility</strong></td>
<td>Project will be viewed as a regional transportation hub, promoting economic development and livability.</td>
<td>Project will be a link to a regional transportation hub, but it is not a primary hub.</td>
<td>Project will be outside of a regional transportation network. Providing linkages to it would not be cost-effective.</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td>Facility will be ADA compliant, accessible to pedestrians, and have adequate signage.</td>
<td>Facility will be ADA compliant, accessible to pedestrians, and have adequate signage. While existing facilities have physical barriers that may prevent persons from having equal access, there is a plan to address the barriers and provide phased-in improvements.</td>
<td>Facility will meet minimum ADA requirements. However, existing facilities have not been upgraded and have physical barriers that may prevent persons with disabilities from having equal access to transportation services.</td>
</tr>
<tr>
<td><strong>Available Amenities</strong></td>
<td>Retail, parking, inside waiting areas, restrooms, restaurants, and entertainment are readily available. The facility will be a destination in its own right.</td>
<td>Sheltered or inside waiting areas, restrooms, and fast food facilities are readily available.</td>
<td>Very few, if any, amenities are available. Waiting areas may be outside, and restrooms may not be readily available.</td>
</tr>
<tr>
<td><strong>Proximity to a Central Business District (CBD) or Activity Center Location that Embraces Mixed-Use Development</strong></td>
<td>Project will be located in a CBD or activity center that embraces mixed-use development. Residents can live, work (or commute), and shop in one neighborhood; visitors view it as an activity hub for the city.</td>
<td>Project will be located in a CBD or activity center that will allow for seamless transportation connections.</td>
<td>Project will be located in decentralized area that lacks seamless transportation connections or connections are unreliable and/or sporadic.</td>
</tr>
</tbody>
</table>
14.2 Matrix as Applied to Union Station, Washington, D.C.

Using the attributes and criteria set forth in the matrix, IPA's research team determined that Washington, D.C.'s Union Station is a model intermodal transportation facility both within the Northeast Corridor (NEC) and the United States. A second matrix was developed for Union Station based on the goals, established during its feasibility study and Master Plan vision, to transform the facility into a dynamic intermodal center with enhanced retail activity.

Matrix of Attributes Affecting Intermodal Facilities
Union Station, Washington, D.C.

<table>
<thead>
<tr>
<th>Attributes Affecting Intermodal Facilities</th>
<th>Highly Supportive of Intermodal Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of Funding Sources and Financing Strategies</td>
<td>The Master Plan provides a phased-in construction approach for Union Station that leverages resources and funding from a variety of public and private sources.</td>
</tr>
<tr>
<td>Cooperation among Stakeholders</td>
<td>The Community Leaders Committee and Technical Advisory Committee were formed to incorporate substantial input and contributions from key stakeholders during the feasibility study and subsequent phases of planning. In a final phase of the feasibility study, a planning charrette was held to interactively engage major stakeholders, facility users, and members of the public.</td>
</tr>
</tbody>
</table>
### Matrix of Attributes Affecting Intermodal Facilities
**Union Station, Washington, D.C.**

<table>
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<th>Attributes Affecting Intermodal Facilities</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Champions and Public Support</strong></td>
<td>The Union Station Redevelopment Corporation (USRC) and District Department of Transportation (DDOT) have convened major stakeholders to develop and implement a common vision for Union Station. Other major stakeholders involved in visioning and master planning include AMTRAK, USDOT, Maryland Transit Administration, Virginia Department of Rail and Public Transportation, and the Washington Metropolitan Transit Authority.</td>
</tr>
<tr>
<td><strong>Location Is Viewed as a Destination</strong></td>
<td>In addition to serving as a hub of transportation services, Union Station has broad appeal as a historic landmark and tourist destination for retail shopping and dining.</td>
</tr>
<tr>
<td><strong>Transportation Modes Supported</strong></td>
<td>Planning for facility improvements, capital investments, and services considered multiple types of rail, bus service, automobile traffic, bicyclists, and pedestrians. Demand forecasts were completed for all modes of transportation and determined that demand for multi-modal transportation will continue to grow. Curbside intercity buses have been incorporated into the facility's design, management, and operating plans.</td>
</tr>
<tr>
<td><strong>Benefits of Facility</strong></td>
<td>In addition to serving as major transportation hub that supports and provides user-friendly connections among all modes, Union Station also is regarded as a retail, social, historic, and cultural destination for area residents, visitors, and commuters.</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td>The facility provides a “fluid pedestrian environment that supports comprehensive connectivity.” Facility will be ADA compliant, accessible to pedestrians, and have adequate signage. A transportation needs assessment, within the feasibility study, identified the need to provide safer pedestrian connections, circulation, and accessibility.</td>
</tr>
<tr>
<td><strong>Available Amenities</strong></td>
<td>Retail, parking, inside waiting areas, restrooms, restaurants, and entertainment are readily available. The facility will be a destination in its own right.</td>
</tr>
<tr>
<td><strong>Proximity to a Central Business District (CBD) or Activity Center Location that Embraces Mixed-Use Development</strong></td>
<td>Transit-oriented, smart-growth development is the cornerstone of the <em>Union Station Master Plan</em>. Burnham Place is envisioned as a major commercial, retail, and residential hub that will serve as a mixed-use development anchor to Union Station.</td>
</tr>
<tr>
<td><strong>Atmosphere of the Facility</strong></td>
<td>Plans “respect the architectural, cultural, and regional significance of the historic Station.” Preserving the historic structure and character of the facility is a guiding principle in plans for future facility improvements.</td>
</tr>
</tbody>
</table>
14.3 Implementation of Planning Framework

Recent reports, including IPA’s *Curbside Intercity Bus Industry: Research of Transportation Policy Opportunities and Challenges*, affirm that curbside intercity bus industry is a formidable force in the competitive transportation market and remains poised for growth and expansion. Providing more travel options, such as curbside intercity buses, can help mitigate congestion and reduce reliance on automobiles. However, a broader set of solutions is needed that work to provide an interconnection of transportation services and modes.

Creating a truly intermodal transportation system can lower transportation costs, increase economic productivity and efficiency, reduce burdens on overstressed transportation infrastructure, improve environmental conditions, and enhance mobility.

In addition, access to a reliable intermodal system can increase community resiliency, livability, and economic sustainability. While “legacy” rail stations can serve as hubs for intermodal transportation activity, investment strategies must benefit all modes and not be limited to rail facility, service, or infrastructure improvements.

The planning framework established in this report—using the ten key attributes contributing to the success of an intermodal transportation hub—may provide a first step for stakeholders to move toward the planning, design, and implementation of an intermodal transportation facility. In addition, three major barriers to intermodal transportation need to be overcome. These include limited federal funding for intermodal projects, lack of cooperation among stakeholders, and inadequate resources to evaluate intermodal projects. Instead of competing for funds to direct toward one mode of transportation, partnerships need to be formed and diverse interests need to come together to leverage funding and resources. A holistic approach is needed to identify priorities, reach consensus, and target investments to a transportation system that supports all modes, provides transportation interconnectivity, and fosters activity-oriented destinations.

Additional research is needed on the business models of curbside intercity bus companies to better understand the “cost of doing business” using the curbside model and whether costs of operating from an intermodal transportation facility are sustainable. Curbside intercity bus companies have been incorporated successfully in and are operating from Union Station in Washington, D.C. The extent to which curbside intercity bus companies either desire, or can afford, to replicate this arrangement at other intermodal facilities needs to be fully explored.
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