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## **Introduction**

Any casual observer of the passenger transportation system today in the United States is aware that problems abound. Whether one is driving or riding on highways, boarding long-distance rail, local transit, or flying on the nation's airlines, problems with congestion, delays, poor on-time performance and customer service, high costs, and an overall poorer quality of travel experience seem to be endemic to the system. Of course, there are exceptions with travel in some locations having improved as a result of new infrastructure, technology, service innovations, or other factors. But with increasing numbers of passengers pressuring existing systems that are unable to cope with the increased demand, the growing and disturbing trend is toward diminution of the quality of passenger travel.

Our increasingly globalized economy is being driven to a large extent by new technologies and innovations in communications and the information sector. An increased amount of business and personal interaction among people and organizations around the world has been facilitated by these innovations. To some extent, communication technologies can serve as a substitute for travel, especially for telecommuting purposes and basic information exchange. But research has also shown that improved communication technology can also *increase* the need for travel as new opportunities for direct interaction arise because of the improved technologies. The world is smaller today because of dramatically improved information flow, despite the fact that physical distances remain the same.

Overcoming the friction of distance is still an obstacle to direct face-to-face communication, and even though transportation technology has improved dramatically over the last two centuries, the pace of improvement has slowed over the last thirty years. There have been very few significant technological breakthroughs and widespread adoptions that have dramatically increased speeds or reduced travel times for passenger transportation systems. Instead, it appears that travel times are increasing, rather than decreasing. According to Coyle, Bardi, and Novack<sup>1</sup>, it took 12 days to travel by pack horse between Philadelphia and Pittsburgh in 1800. By 1840, a canal and railroad system reduced the trip to seven days. In the 1850s, a direct rail line reduced it further to two days, and by 1910, improvements in rail technology cut the trip to just eight hours, representing a 97% reduction in travel time in one century. With the innovation of air transport and subsequent technological improvements, the trip was reduced to 50 minutes

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<sup>1</sup> Coyle, John J., Edward J. Bardi, and Robert A. Novack. 1994. *Transportation*, 4<sup>th</sup> Edition. St. Paul/Minneapolis: West Publishing Company, at 195.

by the 1960s, representing a travel time reduction of another 90% in 60 years. Since the 1960s, however, travel times have not gone down significantly, and in a surprising number of cases, have actually been increasing. Airline travel times in the year 2000 between Philadelphia and Pittsburgh are listed at over an hour, longer than it took in the 1960s.

Not all of the blame should be targeted at the lack of technological breakthroughs. The supersonic Concorde could cover the Philadelphia-Pittsburgh trip in about half the present time, but this aircraft has encountered numerous implementation obstacles, especially concerns with noise, cost of operation, and the recent Air France Concorde crash and grounding of all Concordes casts a large question over the future of commercial supersonic air transport. Very high-speed rail (over 300 mph) systems, including Maglev, are other alternatives that could significantly reduce transport times in selected corridors, but widespread adoption and implementation has been slowed due to capital cost and safety concerns. Rather than lack of technological breakthroughs, it has been operational difficulties, lagging infrastructure development, and lack of coordination among transportation modes that are largely to blame for the lack of progress in transportation performance. The speeds and performance of the line-haul portion of intercity travel have generally been maintained or have experienced some improvement within the last thirty years. It is at the terminals or stations and the intracity portion of the travel where the problems are concentrated.

Both freight and passenger systems suffer from the same affliction of congestion and delays at terminals and in intracity travel. Advantages gained in improving line-haul speeds and travel times can be wiped out with hours or even days of delays into and out

of terminal locations. Operational difficulties occur with increasing regularity as a result of adjusting to new mergers and acquisitions, labor disputes, capacity mismatches, as well as the ever-expanding volume of demand. Basic infrastructure development, such as new or improved terminals, stations, airports, roadways, rail lines, and other necessary systems to enhance efficiency and safety have not kept pace with demand. Finally, better coordination among the modes through a stronger commitment to intermodalism would result in better performance.

Much of the progress that has been made toward the development of an intermodal transportation system in the United States has been on the freight side, led largely by private sector initiatives. Conversely, progress toward developing an intermodal system on the passenger side in the United States has lagged, especially in comparison with systems in Europe. Much of this difference is due to the large role that the public sector plays in passenger transportation, particularly at the intracity scale, and the uneven development of passenger transportation systems in the United States, aside from the private automobile/public highway system. The lack of intermodal systemwide planning has limited the benefits that could be achieved through coordinating and connecting existing passenger systems. Private passenger transportation companies are starting to become interested in intermodalism, and are beginning to develop more innovative programs and plans to tap into the benefits of such an approach.

In order to help promote an improved intermodal passenger system in the U.S., a greater awareness and understanding of the benefits of intermodalism need to be realized. Collecting and organizing data on current intermodal policies, plans, programs, and projects initiated by both public and private sector organizations is critical. As a first step

toward this goal, this paper will identify and assess private sector initiatives among intercity passenger operators, with the purpose of identifying innovative practices. This research will also yield insights from a private sector perspective concerning current progress, barriers, and opportunities of passenger intermodalism. There is wide variation among organizations concerning the degree to which the intermodal concept has been embraced. This research will highlight those companies that are more progressive in spearheading development of an intermodal passenger transportation system in the U.S.

The paper will begin with some background on the major passenger transportation modes in the United States, followed by a discussion of the intermodal concept in passenger transportation. The focus of the paper is on private sector initiatives from the major intercity bus, rail, and air transportation companies in the development of an intermodal passenger transportation system.

### **Passenger Transportation in the U.S.**

Serious students of transportation history understand that modern forms of transportation owe their origins to technological developments largely within the last two centuries. Prior to the 1800s, water transportation via the sailing ship on oceans and other navigable waterways was the primary mode of long distance transport, while land transportation was limited to horse-drawn wagons or carriages traveling on very poor roadways. The building of inland canals helped to bring the advantages of water transport to interior locations, most notably in the opening of the Erie Canal in 1825. But it was the innovation of the steam engine and its application to steamships and railroads that represented a major technological breakthrough, significantly increasing carrying

capacity, speeds, reliability, and geographical reach. In particular, the railroad became the workhorse of long-distance passenger transportation in the U.S., holding a position of unquestioned dominance from the mid-1800s to the 1920s. The application of rail technology to intra-urban transportation occurred through the use of commuter railroads and later through the innovations of the electric streetcar, subway, and elevated rapid transit lines.

The 1900s brought additional technological breakthroughs, particularly the application of the internal combustion engine to the automobile, bus, and truck. The development of the motor vehicle industry revolutionized transportation as well as the national economy. Henry Ford's assembly line and innovative management practices propelled the automobile into becoming the transportation mode of choice and spearheaded long waves of economic development now referred to as the Fordist mode of production.<sup>2</sup> The success of the motor vehicle industry was tied to the inherent advantages of speed, convenience, and reliability that these private forms of transportation conveyed. But a very necessary accompaniment to the success of the private motor vehicle was the public road and highway system. The early public roads and highways of the 1920s and 1930s began to establish motor vehicles as serious competitors to the railroads. The massive road-building and highway programs of the early postwar period (1945-1970), especially the inauguration of the Interstate Highway System in 1956, catapulted the automobile to a position of overwhelming dominance in U.S. passenger transportation at both the intercity and intracity scales. This position of automobile dominance has not eroded, and in fact has strengthened, throughout the latter

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<sup>2</sup> See Kondratieff, N. 1929. *The Long Wave Cycle*. New York: Richardson and Snyder. Amin, A., ed. 1994. *Postfordism*. Cambridge, MA: Blackwell Publishers.

decades of the twentieth century. By 1995, the private automobile accounted for over 80% of U.S. domestic intercity passenger-miles (See Table 1) and over 90% of U.S. intracity passenger-miles.

Another major technological breakthrough of the twentieth century was the invention of the airplane and subsequent developments in aviation. Air transportation represented a great leap forward in domestic intercity and overseas travel through its sheer speed in overcoming the friction of distance. Though starting slowly in the early half of the 20<sup>th</sup> century, air passenger transportation became a major passenger mode by the 1950s, eclipsing rail in 1957 based on intercity passenger miles.<sup>3</sup> The rate of growth in air transport has exceeded all other passenger modes over the last 40 years, and now accounts for a sizeable portion of both intercity passenger miles and numbers of passengers carried by for-hire modes of transport (See Table 2).

Table 1  
U.S. DOMESTIC INTERCITY PASSENGER-MILES, 1995 (Billions of Passenger-Miles)

<u>Mode</u>		
Private Automobile	1,898	80.6%
Airlines	403	17.1%
Bus	28	1.2%
Rail	14	0.6%
Private Aviation	11	0.5%

Source: Eno Transportation Foundation. 1997. *Transportation in America*, Supplement to the Fourteenth Edition. Lansdowne, VA: Eno Transportation Foundation.

Table 2  
U.S. DOMESTIC INTERCITY PASSENGERS CARRIED BY FOR-HIRE MODES, 1995

<sup>3</sup> Sampson, Roy J.; Martin T. Farris; and David L. Schrock. 1990. *Domestic Transportation: Practice, Theory, and Policy*, 6<sup>th</sup> Edition. Boston: Houghton Mifflin Company, p. 134.

(Millions of Passengers)

Air	499	40.5%
Bus	359	29.2%
Rail, Commuter	351	28.6%
Rail, Amtrak	20	1.7%

Source: Eno Transportation Foundation. 1997. *Transportation in America*, Supplement to the Fourteenth Edition. Lansdowne, VA: Eno Transportation Foundation.

The U.S. airline industry has grown and developed under two different regulatory phases.<sup>4</sup> From 1938 to 1978, the Civil Aeronautics Board regulated the industry with respect to market entry and exit, pricing, mergers and acquisitions, and subsidies.

Airlines were required to receive CAB approval for any changes they wished to make in routes, fares, or company structure. The industry developed within this regulatory framework so that airlines became established as either trunk (major) carriers, local service (regional) carriers, intrastate, charter, or air taxi (commuter) carriers. Airlines including American, Braniff, Continental, Delta, Eastern, Northwest, United, and Western were among the trunk airlines, serving the major transcontinental routes. By 1978, the trunk airlines accounted for 87% of domestic revenue passenger miles (RPMs) within the airline industry.

Deregulation of the airline industry in 1978 heralded the beginning of the second major phase in the evolution of the industry. The CAB was phased out, while airlines were allowed to serve any route at any fare, while they were also allowed to merge with and acquire other airlines. During the first five years of deregulation, former regional airlines (e.g., USAir, Texas International), intrastate (e.g., Southwest), and new "upstart" carriers (e.g., People Express, New York Air) began to challenge the majors and reduced

their domestic RPMs to 75% by 1983. What followed from 1983 to 1993 was a wave of mergers, acquisitions, and bankruptcies that resulted in a much fewer number of major carriers emerging as the dominant players in the industry. By 1993, eight major carriers (United, American, Delta, Northwest, Continental, US Airways, TWA, and Southwest) controlled 93% of domestic RPMs. Since 1993, another wave of new entrant carriers (e.g., ValuJet/AirTran, Kiwi, Spirit, Frontier, Vanguard, Western Pacific) have tried to become established service providers, with mixed success. Today, the airline industry is still dominated by a small number of major carriers, and the possibility of another round of merger activity exists as evidenced by United Airlines' recent announcement of its intention to merge with USAirways and the code share agreement between Northwest and Continental.

The intercity bus industry in the United States has faced a more difficult road in its quest to serve the traveling public. After a period of early rapid growth in the 1930s and 1940s, the intercity bus industry has maintained about the same number of passenger-miles since 1945. Combined with the dramatic increases in automobile and air traffic, the bus industry has seen its share of intercity passenger-miles decrease over time to 1.2% by 1997. Still, the bus industry accounted for 359 million intercity passengers in 1997, second only to air among the for-hire modes, representing nearly 30% of intercity passengers (See Table 2). According to the American Bus Association, buses serve 4,274 towns in the U.S., considerably more than air and rail.<sup>5</sup> Many small towns rely solely on bus service as the only non-automobile passenger transportation alternative.

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<sup>4</sup> Much of the following material about the airline industry is from Goetz, Andrew R. and Christopher J. Sutton. 1997. The Geography of Deregulation in the U.S. Airline Industry. *Annals of the Association of American Geographers* 87(2): 238-263.

<sup>5</sup> American Bus Association webpage.

There are approximately 3,600 bus companies operating in the U.S. today<sup>6</sup>. The largest bus company is Greyhound Lines, accounting for approximately 20% of RPMs in the intercity bus industry<sup>7</sup>. Greyhound is the only nationwide provider of scheduled intercity bus transportation services in the U.S, serving more than 2,500 destinations.<sup>8</sup> Greyhound recently merged with Laidlaw, Inc. of Canada, which also owns Greyhound Lines of Canada and certain Grey Line franchisees.<sup>9</sup> Most other bus companies operate contract charter and special service, offering non-scheduled specialized service to and from specific points for groups of passengers.<sup>10</sup> Some local service bus companies offer intercity service in and around major metropolitan centers, usually for longer distance commuting trips.<sup>11</sup>

From the mid-1800s to the 1920s, intercity passenger transportation in the U.S. was dominated by the private railroads. From 1945 to 1970, the private rail passenger industry experienced a period of precipitous decline attributable largely to competition from the automobile/highway system and the airlines. By 1970, intercity rail travel shrunk to 10% of levels attained during the early 1940s, and practically all the private railroads were losing money on their passenger services.<sup>12</sup> This dire situation led directly to governmental intervention to try to salvage passenger railroad service through the creation of the National Railroad Passenger Corporation, a quasi-governmental corporation, otherwise known as Amtrak. Amtrak relieved private railroads of their

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<sup>6</sup> American Bus Association webpage.

<sup>7</sup> Greyhound Bus Lines webpage.

<sup>8</sup> Greyhound Bus Lines webpage.

<sup>9</sup> Greyhound Bus Lines webpage.

<sup>10</sup> Sampson, Roy J.; Martin T. Farris; and David L. Schrock. 1990. *Domestic Transportation: Practice, Theory, and Policy*, 6<sup>th</sup> Edition. Boston: Houghton Mifflin Company, p. 140.

<sup>11</sup> Sampson, Roy J.; Martin T. Farris; and David L. Schrock. 1990. *Domestic Transportation: Practice, Theory, and Policy*, 6<sup>th</sup> Edition. Boston: Houghton Mifflin Company, p. 140.

passenger obligations through establishment of a basic nationwide network of rail passenger service initially using private railroad rolling stock and rights of way.

Since 1970, Amtrak has tried to stabilize and reinvigorate the passenger rail industry in the U.S. Although revenue passenger-miles have increased somewhat since 1970, intercity rail continues to fall farther behind private automobiles and the airlines. Amtrak has had a difficult time financially during this period, never having turned a profit. The percentage of revenues covering costs has ranged from 37% to 80%.<sup>12</sup> The most successful part of Amtrak's operation has been the Northeast Corridor service between Boston, New York, and Washington. In this congested high-density corridor, frequent and relatively high-speed trains have been effective competitors to the highways and airlines. Outside of the Northeast Corridor and a few other higher-density corridors, the rest of Amtrak's system is characterized by less frequent, slower-moving trains over longer distances serving lower density markets. It is in these markets where Amtrak currently cannot compete with its competitors, although the type of service Amtrak provides here is geared to a more specialized tourist market, rather than business.

A relatively large number of rail passengers use commuter rail services provided by various private companies and public authorities in and around major metropolitan centers. Commuter rail operations such as New York's Long Island Railroad, the commuter rail "T" lines in Boston, MARC in the Washington, DC/Baltimore area, the Chicago and Northwestern in Chicago, Tri-Rail in Southeast Florida, and the Bay Area commuter rail lines in San Francisco are good examples. In some ways, these commuter

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<sup>12</sup> Sampson, Roy J.; Martin T. Farris; and David L. Schrock. 1990. *Domestic Transportation: Practice, Theory, and Policy*, 6<sup>th</sup> Edition. Boston: Houghton Mifflin Company, p. 143.

<sup>13</sup> Nice, David C. 1998. *Amtrak: The History and Politics of a National Railroad*. Boulder, CO: Lynne Rienner Publishers, p. 90.

lines should really be categorized as intracity rail, as commuting trips tend to be much shorter than standard intercity trips, and usually occur within the travelshed of the extended metropolitan area. These commuter rail operations have grown significantly in recent years, and will probably continue to grow as exurban highways and roadways become more congested with commuter activity.

In sum, intercity passenger transportation in the U.S. today is dominated by the private automobile/highway system and the air transportation system. But as was noted earlier, these systems are suffering from increased congestion and delays, and the pace of progress in improving speed and reliability has slowed significantly. These problems must be addressed in numerous ways, including the development of a truly intermodal passenger transportation system, where the strengths of each mode can be utilized to greater effect within an integrated system. It is to this topic that we now turn.

### **Intermodal Transportation**

Precisely defining intermodal transportation is a tricky endeavor. There are numerous definitions of the term, each with their own nuances that may be applicable in particular contexts. A basic definition would be “being or involving transportation by more than one form of carrier during a single journey.”<sup>14</sup> A fuller definition would be “the concept of transporting passengers and freight on two or more different modes in such a way that all parts of the transportation process, including the exchange of information, are efficiently connected and coordinated.”<sup>15</sup> This second definition is more

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<sup>14</sup> *Merriam-Webster's Collegiate Dictionary*, 10<sup>th</sup> Edition, 1994.

<sup>15</sup> Muller, Gerhardt. 1999. *Intermodal Freight Transportation*, 4<sup>th</sup> Edition. Washington, DC: Eno Transportation Foundation and Intermodal Association of North America, p. 1.

descriptive of the larger meaning associated with intermodalism, particularly regarding the efficiencies that accrue as a result of connected and coordinated services. Strictly speaking, intermodal transportation has been in existence throughout human history, such as when the first sailing ships were loaded with cargo taken from horse-drawn carts. But these simple transfers of freight or passengers from one mode of transport to another have come to be viewed largely as separate activities from the perspective of the individual modes of transportation. An intermodal approach sees the whole process of moving people or goods as a connected intermodal system working together as opposed to separate modal systems working independently.

This intermodal approach to transportation is becoming more widely recognized by private sector providers of transportation, governmental agencies, and the larger transportation community. The private sector has led the way in the adoption of intermodal technologies within the freight transportation arena, most notably the pioneering efforts of Malcolm McLean and Sea-Land Services in the 1950s in spearheading the container revolution, as well as the development of piggyback services (trailer on flat car [TOFC] or container on flat car [COFC]) by the freight railroad and trucking industries starting in the 1950s. Today, intermodal operations are part and parcel of the shipping, railroad, trucking, and air cargo businesses, and have resulted in a much more integrated and efficient freight transportation system. An intermodal approach has resulted in increased profitability, better utilization of existing infrastructure, reduction in need of additional capacity, lower prices, and better customer service.<sup>16</sup>

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<sup>16</sup> Eno Transportation Foundation. 1999. Notes from Conference "Towards a Seamless Intermodal Passenger Transportation System," November 17, 1999, Washington, DC.

Over 40 years of intermodal development on the freight side have shown that an intermodal approach is more efficient. Unfortunately, a similarly successful track record on the passenger side does not exist because the passenger system has lagged behind. Nevertheless, it is expected that similar efficiencies can be gained when applying intermodal concepts and practices to the passenger arena. Theoretically, improvements in physical connectivity and information coordination should result in substantial efficiencies that will benefit all passenger modes so engaged. As more passenger operators engage in intermodal linkages, there will develop a track record that can be analyzed to determine precise benefits achieved through the adoption of specific intermodal operations.

The U.S. Department of Transportation and other governmental entities have reacted to the intermodal revolution in freight transportation by adopting and promoting it as official policy in both freight and passenger transportation. The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) was the first major piece of federal transportation legislation that did not contain the word "highway". It signaled a shift in thinking about transportation away from individual modal perspectives to a more integrated intermodal approach. Since government is responsible for providing much of the infrastructure used in both freight and passenger transportation in the US, government recognition of intermodalism is an important step in the development of the larger system, particularly for the passenger sector.

It is increasingly being recognized that the benefits of an intermodal approach already realized in the freight transportation industry can be extended into the passenger transportation arena. Whether or not passenger services are provided by the private

sector or by government, thinking in terms of providing seamless, door-to-door service through a combination of integrated modes must be a part of present and future planning activities. Passenger transportation has lagged behind freight transportation in the US in the adoption of intermodalism. Furthermore, other countries around the world, especially in Europe, have developed better intermodal passenger systems. The bad news is that the US is behind in passenger intermodalism; the good news is that there are good examples of how it can be done based on both US freight intermodalism and European passenger intermodalism.

Over 40 years of intermodal development on the freight side in the U.S. have shown that an intermodal approach is more efficient. Unfortunately, a similarly successful track record on the passenger side in the U.S. does not exist because the passenger system has lagged behind. Nevertheless, it is expected that similar efficiencies can be gained when applying intermodal concepts and practices to the passenger arena. Theoretically, improvements in physical connectivity and information coordination should result in substantial efficiencies that will benefit all passenger modes so engaged. As more U.S. passenger operators engage in intermodal linkages, there will develop a track record that can be analyzed to determine precise benefits achieved through the adoption of specific intermodal operations.

### **Vision of an Intermodal Passenger Transportation System**

Imagine a future whereby an individual takes a trip from Meridian, Mississippi to Vouray, France using a combination of modes including local transit, intercity bus, intercity high speed rail, and international air in which only one through-ticket has been

purchased and baggage is picked up at the origin and delivered to the final destination.<sup>17</sup>

This vision, elaborated by Gil Carmichael, describes the essence of what intermodal passenger transportation is all about: seamless, efficient, environmentally sound, and safe transportation for travelers moving from point-to-point throughout the world.

When Federal Express or UPS delivers a package from Haverhill, Massachusetts to Columbus, Indiana, several modes of transportation are involved but the customer calls one company and the delivery occurs with a guaranteed time of arrival. But if a non-driving passenger wishes to make the same trip, that person would have to contact at least four separate transportation providers to schedule the trip at a relatively high cost with no assurances of actual time of arrival.<sup>18</sup> This example illustrates important differences between the freight and passenger transportation sectors in the US. To be fair, it should be recognized that it is easier in most cases to ship packages rather than people.

Packages do not talk back, and don't mind being stacked up in warehouses or on trucks. Still, given the importance of transporting people, one would think that performance can improve to at least approximate the efficiencies already achieved in the freight sector.

The vision of a seamless, integrated passenger system in the US can be made more focused by considering actual practices in more intermodally advanced places such as Europe. The infrastructure of European passenger operations is much better as the individual systems of intercity rail, bus, and local transit are themselves better developed. But the Europeans have made important strides in linking these systems together so that connections are much more convenient to the traveler. The classic example is the

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<sup>17</sup> Carmichael, Gil. 1997. "An Overview of the 21<sup>st</sup> Century North American Intermodal System." *Transportation Law Journal* 25(3), p. 321.

intercity rail stations in the lower levels of major European airports, including Charles de Gaulle in Paris, Gatwick and Heathrow in London, Frankfurt, Amsterdam, and Zurich. With the development of the Trans-European High Speed Rail Network, an international flight to any of these major airports provides convenient access to the numerous cities and towns throughout Europe. Once reaching the desired city, the more ubiquitous local rail transit or bus systems can take travelers close to their final destinations. The European intermodal system is not perfect but it is a distinct improvement over what is available in the US.

### **Intermodal Passenger Transportation in the US**

The successful application of intermodal principles to transportation relies on three critical factors: infrastructure, information technology, and cooperation.<sup>19</sup> In freight transportation, most of the intermodal innovations in infrastructure, information technology, and cooperation were developed by the private sector, as individual companies within modes worked with other companies from other modes to create a better, combined service for the customer. In the passenger arena, the public sector plays a much larger role as both provider of infrastructure and services, especially at the intracity scale. But the private sector is a major passenger service provider at the intercity scale, most notably in the form of the airlines, bus companies, and intercity passenger rail. If the evolution of a passenger intermodal system in the US takes a path

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<sup>18</sup> Coogan, Matthew A. 1993. "Airport Access: Case Study in Intermodalism." *Intermodal Planning: Concept, Practice, Vision*, Special Report 240, Transportation Research Board, National Research Council, pp. 90-91.

<sup>19</sup> Eno Transportation Foundation. 1999. Notes from Conference "Towards a Seamless Intermodal Passenger Transportation System," November 17, 1999, Washington, DC.

similar to that of freight, it will be the private sector that will be the driving force for the changes necessary to create an integrated, seamless system.

The challenges to achieving such an intermodal system in the US are great. Even if the private sector passenger companies are willing to make intermodalism a reality, many of the changes must rely on an infrastructure that is largely the domain of the public sector. The cooperation between private companies will require cooperation with public sector authorities responsible for turning the airports, rail stations, and bus stations into fully integrated intermodal terminals. Public sector progress is a critical element in the ultimate success of passenger intermodalism, and is the subject of further research on the efforts of the US DOT, state DOTs, metropolitan planning organizations, regional transportation authorities, transit agencies, and individual counties, cities, and towns to implement intermodal initiatives. The purpose of the remainder of this paper, however, is to focus on the progress made thus far by leading private sector passenger transportation companies in helping to achieve the vision of an intermodal passenger transportation system in the US.

#### ***Private Sector Progress in the United States: Current Program Initiatives***

The three major modes of commercial intercity passenger transportation in the United States have different goals and objectives concerning intermodal partnerships with each other. This section's focus is on existing programs that are already in place for bus, rail, and air intermodal transportation.

##### ***a. Bus***

The major intercity bus carrier in the United States is Greyhound Lines, Inc. based in Dallas, Texas. As the most flexible of the three modes, Greyhound is able to

adjust its schedules and routes to meet the requirements of its rail and air partners. The largest alliance is with Amtrak, called "Amtrak Thruway Connections". Thirty-four of Greyhound's routes are sold as part of the Amtrak connection and allow travelers in such locations as Phoenix, Duluth, Boise, and Columbus a linkage to Amtrak's nationwide rail system. Appendix A and Figure 1 show the Amtrak connecting stations and the routes served by Greyhound or a subsidiary of Greyhound. The intermodal service offered by the two companies allows for travelers to purchase a single ticket good for travel on both modes. Along with the service alliance that Greyhound and Amtrak have, the carriers are also co-located at 36 intermodal transfer stations across the country.

Greyhound's linkage with air service providers is not as strong as its alliance with Amtrak. The only true alliance that Greyhound has with an airline is through its Peoria-Rockford subsidiary with United Airlines at Chicago O'Hare. With this alliance, passengers wanting to travel to/from Rockford, Illinois can purchase tickets to their destination on United Airlines. Passengers are transported to/from Chicago O'Hare on bus service provided by the Peoria-Rockford Bus Company and from there United takes passengers to their final destination. The service is marketed by United as Groundlink and by Greyhound as Flightlink. Benefits of this service include one ticket and one reservation convenience, a discount when purchasing the tickets together instead of separately, and frequent flier mileage for the ground travel. Greyhound offers its Flightlink services at 16 other airports but none of the routes are tied to specific carriers at the airports Greyhound serves, and none of the service is quoted in any airline CRS (See Appendix B).

These are not the first attempts by Greyhound to link up with air carriers in the United States. During the 1980s the company had an agreement with America West to connect Scottsdale, Arizona to America West flights at Phoenix Sky Harbor Airport. During this same period Greyhound also had an agreement with the now defunct PEOPLExpress. As late as 1997-1998 Greyhound and Airtran Airways had a code share agreement between Airtran's hub at Atlanta Hartsfield and Macon, GA and Chattanooga, TN. This agreement like the previous ones in the 1980s ended. Greyhound's agreement with United should prove to be a better agreement because of the volume of traffic that the airline carries.

Greyhound is taking the initiative in passenger intermodal service. The carrier already participates in 87 intermodal facilities across the nation and is involved in the planning and development in over 100 others. Not all of the facilities involve a connection between major transportation companies but instead may involve a shift from Greyhound to a local or regional transit system including intercity buses, transit buses, and light rail systems.

***b. Rail***

Amtrak, the National Railroad Passenger Corporation, created by the federal government to take over the nation's intercity passenger rail services, commenced operations in May 1971. The carrier's largest intermodal passenger alliance with Greyhound is discussed in the previous section. Amtrak also has alliances with two air carriers in the United States, Alaska Air and United.

The alliance with Alaska Air allows Alaska Airlines Mileage Plan members to earn miles when they travel on Amtrak's Coast Starlight, Cascades, Capitols, San

Joaquin's, or San Diegans rail service. The alliance does not include any service agreements between the two participants.

The alliance between Amtrak and United is a service agreement but is still not a true intermodal agreement. The Air Rail program allows a passenger to fly one direction on United and Amtrak provides transportation in the other direction. Air Rail allows the passenger to make up to three stopovers along the Amtrak portion of the journey and is priced cheaper than if each of the components were purchased separately.

Slow progress is being made in linking Amtrak stations to airports to facilitate connections to airline services. The Amtrak station at Baltimore-Washington International Airport is located several miles away from the airport terminal, and passengers must be bused between the two locations. Connections between Amtrak stations and airports in Newark, New Jersey and Providence, Rhode Island are currently being developed, though in neither case will the rail line connect directly into the terminal. Disappointingly, there are no existing or planned intercity rail stations in the US located directly underneath an airport terminal building, such as is found in many European airports. Until physical connectivity between intercity rail stations and airports improves dramatically, tremendous opportunities for passenger intermodal development will be lost.

Amtrak promotes auto/rail passenger intermodal travel through its AutoTrain product. With this service, passengers and their cars are transported together between Washington D.C. and Orlando, Florida. The train departs suburban Washington D.C. at four in the afternoon and arrives in suburban Orlando at 8:30 the following morning.

This type of passenger intermodal travel allows the passengers to use their own vehicles at both ends of the trip.

Amtrak is also developing greater connectivity with some local transit systems, particularly along the Northeast Corridor. The construction of intermodal passenger terminals, such as Washington, DC's Union Station, facilitates convenient connections between Amtrak and the local transit system. Amtrak's EZPass program will allow the use of the same debit card on the Amtrak system as well as the participating local transit operations.

*c. Air*

A survey of the websites and schedules for the largest US airlines shows that only two, United and Frontier, promote their passenger intermodal service domestically. United's intermodal service is marketed as Groundlink and is bus or van service from selected United destinations to other metropolitan cities that are more efficiently served by ground transportation than by air. Appendix C and Figure 2 show the airports and the destinations offered by this service. In the case of Rockford-Chicago O'Hare, the service opens up slots at O'Hare for United and allows the carrier to offer more frequency than it would be able to with an aircraft. Similar arguments can be used for the Groundlink service out of Denver. United is also looking into creating an alliance with the Chicago Transit Authority, which operates the train to downtown Chicago from Chicago O'Hare. The airline would offer through ticketing adding an additional small fee to cover the train portion of the journey.

Frontier Airlines, based at Denver International Airport, offers a similar product to United's Groundlink called the Freeway Flyer. The Freeway Flyer is motor coach

service from Boulder to Denver six times a day. The unique aspects that make this product different than the other products previously mentioned is that the service is free. The other carriers add the cost of the service into the overall price of the ticket whereas Frontier does not charge for the service. The carrier also checks the passengers' bags to or from the Boulder stop all the way through to the final destination. With United's Groundlink, passengers have to collect their baggage at mode switch and transport them to the other mode.

Internationally, two carriers, United and American, have codeshare agreements with European train companies to provide service between Charles de Gaulle airport in Paris, France and selected destinations in France and Belgium. Both of the carriers have agreements with SNCF on its high-speed passenger train for a number of destinations in France. The destinations included in the codeshare agreements are shown in Table Three.

DESTINATION	US AIRLINE
Angers	United
Bordeaux	United
Le Mans	United
Lille	United/American
Lyon	United/American
Nantes	United/American
Poitiers	United
Rennes	United
Tours	United

Table 3 SNCF Destinations included in code share

In addition to its codeshare alliance with SNCF, American also has a code share agreement with Thalys, a joint train venture between Belgian, French, British, and German railways, for service between Paris Charles de Gaulle and Brussels. Both of the agreements still make passengers shift their own luggage between modes.

## **Hurdles to Passenger Intermodal Travel**

The Vice President of Southwest Airlines, Pete McGlade, points out that airlines may not be the best entity to provide “seamless” travel. McGlade believes that his company is so successful because they focus on one thing, carrying air passengers and a foray into other modes would deviate resources away from this success. This does not mean that the carrier is against intermodal services. The carrier believes in intermodal linkages if another transportation company can tap into the strength of the carrier and provide a service that benefits both of them. McGlade points to the success of the Betty Bus, a bus that carries Memphis travelers to Little Rock where they can fly on Southwest to their final destination for less than they could from Memphis, as an example of the type of indirect relationship in which the carrier participates.<sup>20</sup>

The Chief Executive Officer of Greyhound, Craig Lentzsch, points out two different reasons why intermodal services are facing difficulties in the United States. The lack of intermodal facilities is the first hurdle faced by companies that want to provide intermodal services. While bus and rail services are linked at a number of terminals across the nation, the linkages at airports are fewer and farther between. Without dedicated terminals, intermodal services will continue to be difficult to achieve in the United States.<sup>21</sup>

Airports, in particular, have become major obstacles to improving intermodal connections. There are currently no policies or common guidelines to accommodate ground transportation at airports, as each airport has its own decisional authority

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<sup>20</sup> Street, Jim. 2000. *Intermodal travel: Getting there*, Airport Magazine.

<sup>21</sup> Statements of Craig Lentzsch, Chief Executive Officer, Greyhound Bus Lines, July 27, 2000.

regarding the extent to which it will accommodate ground transportation service providers. This applies to local transit systems, taxis, shuttle services, as well as to intercity carriers. Some recognition of this problem has appeared in recent FAA reauthorization bills that mention the accommodation of surface transportation needs at airports, but how individual airports actually respond varies dramatically.

The second hurdle facing alliances between modes is the dissemination of information to the public and travel professionals concerning the linkages that are available to them. Lentzsch believes that affordable listings in computer reservation systems and the creation of a system, possibly web based, that the public can access for information on fares and schedules, is paramount to passenger intermodal success in the United States.<sup>22</sup>

Yet another possible barrier to passenger intermodal travel in the United States may be the codeshare agreements that air carriers have with smaller commuter air carriers. Examples of this include United/United Express and American/American Eagle. In these agreements the smaller carrier uses smaller aircraft (in terms of seats) to serve thinner routes from hub airports than could be economically served by the larger carrier. These agreements may prevent the larger carriers from entering into agreements with other modes; this also may be the case internationally.

### **Next Steps**

Overcoming barriers to passenger intermodalism in the U.S. involves three major categories of next steps: continued development of physical infrastructure (especially terminals), improved information systems, and expanded policies and programs that

facilitate intermodal cooperation. The physical infrastructure of passenger transportation systems must continue to be improved if passenger intermodalism is to develop. This is particularly important for the intermodal terminals that serve as the linchpins connecting the system. Without effective physical connectors, smooth and seamless services are impossible. Efforts to build these intermodal facilities should be expanded so that every city and town in the U.S. has a passenger intermodal facility that serves as a focal point for the intercity and intracity transportation systems serving that place.

Information systems that include all major modes of passenger transportation would greatly facilitate intermodal connections. These systems are a necessary prerequisite to achieving the vision of one-stop, seamless, door-to-door passenger service that has become the industry standard for package delivery. Significant advances are being made in the development of inclusive computer reservations systems within the airline industry. Similar advances need to be made including all passenger modes.

Cooperation within and between the private and public sectors remains the key ingredient in making intermodalism a reality. Private sector progress will occur only so far as the industry can create profitable services. As more passenger intermodal initiatives are implemented over time, a longer track record of performance can be assessed to determine the successfulness of these innovations, which should result in an expansion of intermodal services. Mutually beneficial cooperation between private sector companies will make this happen. But cooperation must also include the public sector in the provision of physical infrastructure, information systems, and the policies that will facilitate implementing intermodal initiatives.

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<sup>22</sup> Statements of Craig Lentzsch, Chief Executive Officer, Greyhound Bus Lines, July 27, 2000.

## **Conclusion**

In comparison to intermodal freight transportation in the US or intermodal passenger transportation in Europe, the development of an intermodal passenger transportation system in the US continues to lag behind. An assessment of recent private sector initiatives toward the goal of providing intermodal passenger services indicates that some progress is being made. Both Greyhound Bus Lines and Amtrak realize that the current and future success of intercity bus and rail is directly linked to the intermodal connectivity that can be established to each other, the airlines, and local transit systems. The airlines, with the possible exceptions of United, Frontier, and American, have not embraced the intermodal concept to the same degree. In many ways, the airlines regard themselves as a separate mode providing only air transportation, not a part of a seamless intermodal system. Yet, United Airlines, through its Groundlink services and its Air Rail program, is at least starting to develop an intermodal consciousness. The financial success of these and other programs will obviously be critical to the continuation and expansion of intermodal initiatives among the airlines, Greyhound, and Amtrak.

The success of private sector initiatives also depends greatly on the progress of the public sector in helping to provide the infrastructure and services necessary to make the vision of passenger intermodalism possible. The most important endeavor in this area is the construction and expansion of intermodal terminals that bring air, rail, bus, local transit, and the private automobile together so that the advantages of each mode can be maximized within an integrated system. Nowhere is this need greater than at the nation's major airports, where direct physical connections to Amtrak and Greyhound in particular

are woefully inadequate. There are currently no Amtrak stations located directly at a major airport in the US, and Greyhound has encountered difficulties in getting direct curb access to some of the nation's major airports. Turning airports into intermodal centers should be a top priority of the US Department of Transportation.

Passenger transportation in the US will benefit from intermodal initiatives taken by both the private and public sectors. In conjunction with other strategies to develop new technologies, enhance capacity, and improve operational efficiency, an intermodal approach will help solve many of the problems that currently plague the US passenger transportation system.

AMTRAK CONNECTING STATION	ROUTE	DAILY ROUND TRIPS
Washington	Washington-Charlottesville	2
	Washington-Pittsburgh	1
St. Albans, VT	St. Albans-Montreal	1
Rocky Mount	Rocky Mount-Wilmington	2
Atlanta	Atlanta-Macon	1
	Atlanta-Columbus	1
	Atlanta-Chattanooga-Nashville	1
	Atlanta-Mobile	1
Miami	Miami-Key West	1
Pittsburgh	Pittsburgh-Columbus	2
Cleveland	Cleveland-Columbus-Cincinnati	2
Chicago	Chicago-Indianapolis-Cincinnati	1
	Chicago-Indianapolis-Louisville	2
	Chicago-Marquette	1
Minneapolis	Minneapolis-Duluth	1
	Minneapolis-Eau Claire	1
New Orleans	New Orleans-Mobile	1
	New Orleans-Baton Rouge	1
Houston	Houston-Dallas	1
Dallas	Dallas-Abilene-Odessa	1
San Antonio	San Antonio-Laredo	1
	San Antonio-Brownsville	1
Denver	Denver-Vail-Eagle	1
	Denver-Colorado Springs-Pueblo	2
Glenwood Springs	Vail-Eagle-Glenwood Springs	1
Raton	Denver-Raton	1
Albuquerque	Albuquerque- El Paso	1
Salt Lake City	Salt Lake City-Pocatello-Idaho Falls	1
Flagstaff	Flagstaff-Phoenix	1
Los Angeles	Los Angeles-Las Vegas	5
Bakersfield	Bakersfield-Las Vegas	1
Portland	Portland-Pendleton-Boise	2
	Portland-Medford-Ashland	2
	Portland-Bend	1

Appendix A

AIRPORT SERVED	KEYCITIES SERVED
Albuquerque	Santa Fe, Taos, Durango, Farmington, Roswell
Atlanta	Columbus, Montgomery
Chicago	Rockford
Denver	Vail, Eagle, Glenwood Springs, Grand Junction
Key West	Greyhound's bus station at the airport
Louisville	Fort Knox
Manchester, NH	Boston, Burlington, White River Junction
Melbourne	Greyhound's bus station at the airport
Miami	Key West
Milwaukee	Green Bay, Oshkosh, Appleton, Sheboygan, Fond du Lac
Moline	Greyhound's bus station at the airport
Nashville	Knoxville, Memphis, Jackson, Paducah
New Orleans	Mobile, Baton Rouge, Lafayette
Phoenix	Flagstaff, Tucson, Yuma
San Francisco	San Jose, Santa Cruz, Salinas
South Bend	Greyhound's bus station at the airport
St. Louis	Columbia, Springfield, Ft. Leonard Wood
Syracuse	Watertown, Potsdam, Massena
Washington Dulles	Charlottesville, Winchester, Staunton, Lynchburg, Roanoke

Appendix B

<b>AIRPORT</b>	<b>DESTINATION</b>	<b>OPERATOR</b>
DENVER	BRECKENRIDGE	RESORT EXPRESS
	COPPER MOUNTAIN	RESORT EXPRESS
	KEYSTONE	RESORT EXPRESS
	FORT COLLINS	AIRPORT EXPRESS
	LOVELAND	AIRPORT EXPRESS
	NIWOT/LONGMONT	AIRPORT EXPRESS
	VAIL	COLORADO MOUNTAIN EXPRESS
	BEAVER CREEK	COLORADO MOUNTAIN EXPRESS
PORTLAND	CORVALLIS/ALBANY	ANTHONY'S AIRPORTER
	SALEM	HUT AIRPORT SHUTTLE
CHICAGO O'HARE	ROCKFORD	PEORIA-ROCKFORD BUS COMPANY
SAN FRANCISCO	SAN JOSE	THE SOUTH BAY FLYER

Appendix C

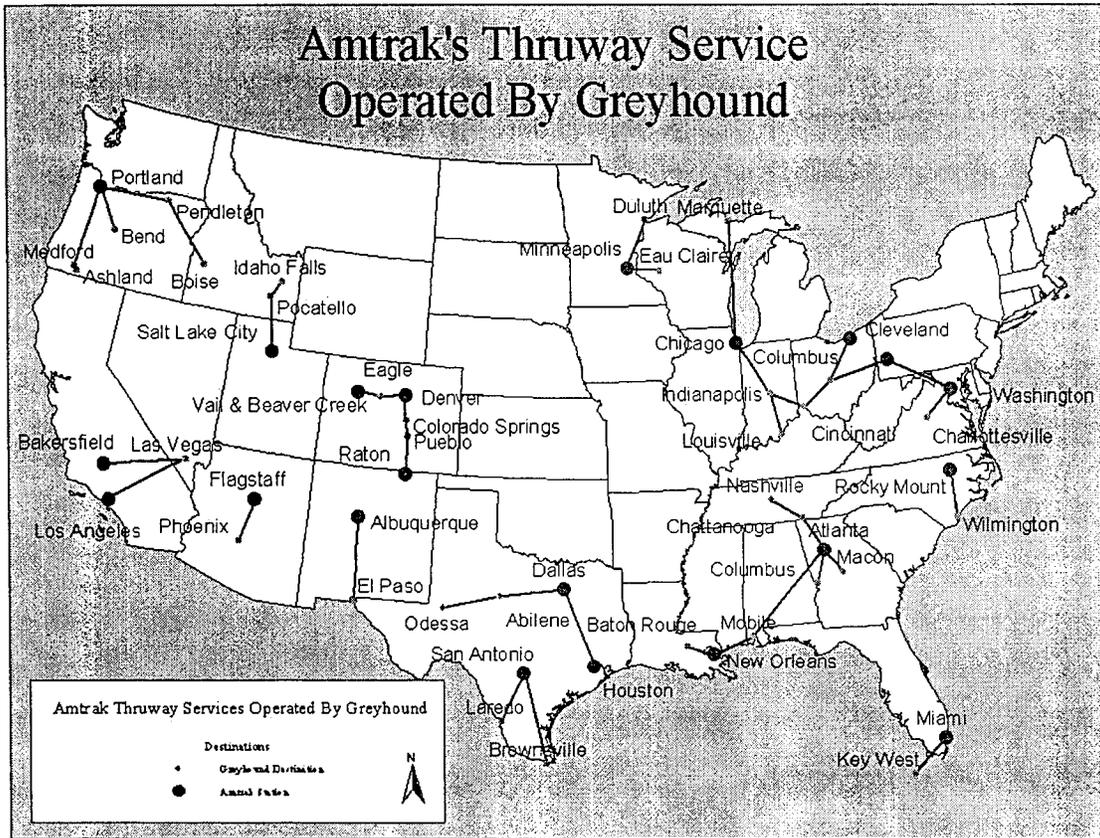


Figure 1

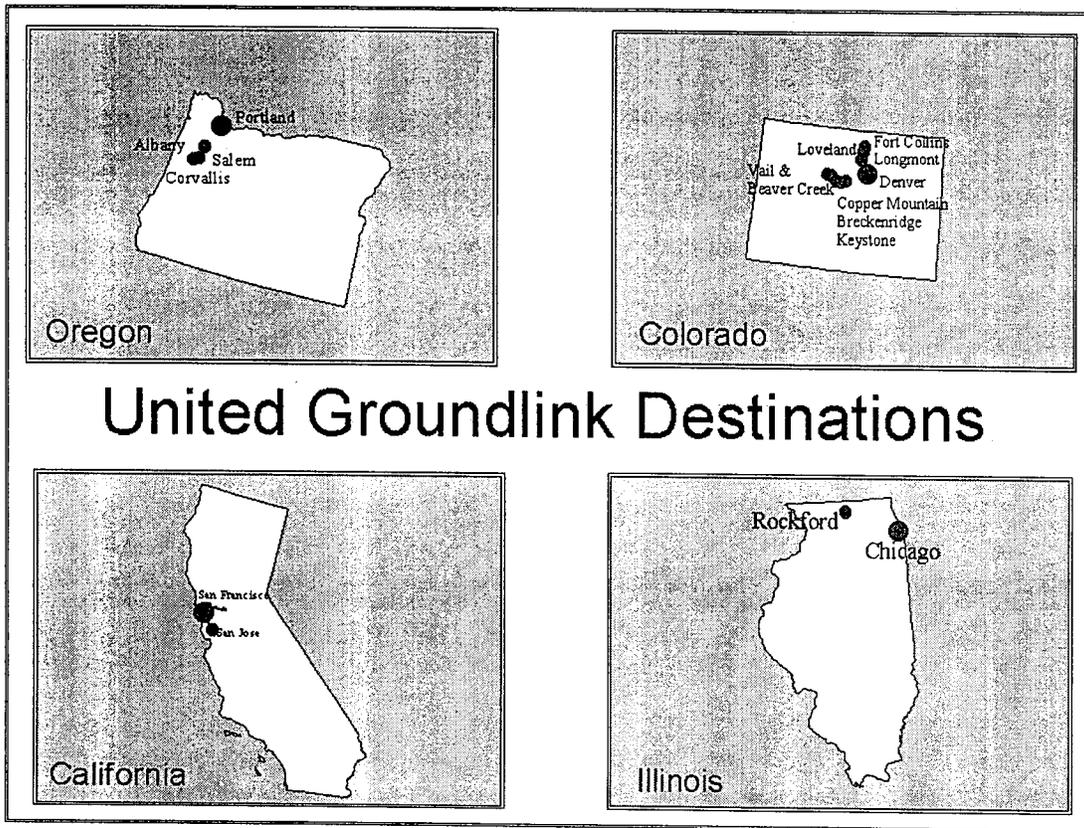


Figure 2

