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Making Connections: Intermodal Links Available at 70 Percent of all Stations Served by Commuter Rail, 2010.

by Bruce Goldberg

Intermodal connections with other scheduled public transportation modes are available at 70 percent of all stations served by commuter rail trains. Commuter rail passengers are able to connect to other transportation modes at 812[1] of the 1,160 stations served by commuter trains that operate over the tracks of the national rail network.[2] The percentage of commuter rail stations with intermodal connectivity exceeds that of the other modes (airline, intercity rail, and ferries) included thus far in the Bureau of Transportation Statistics' Intermodal Passenger Connectivity Database (IPCD).

The commuter rail network covers 34 metropolitan areas across the country and provides regional rail service within a single or two adjacent metropolitan areas. Commuter trains, which may be either diesel or electrically powered, operate over tracks of the national rail system, frequently sharing the same right-of-way with freight trains or intercity passenger trains. They generally operate from outlying stations within a metropolitan area to the predominant city in that area.[3] However, a few commuter rail systems operate between adjacent metropolitan areas.

Commuter rail services are often affiliated with other local transit networks, and so commuter rail stations are frequently served by local transit buses. Transit bus is, by far, the most frequent connection to commuter rail networks, serving 801 of the 812 commuter rail stations that have intermodal connections. These connections effectively extend access to the commuter rail network beyond the immediate station area to the wider area served by the transit bus network.[4] Some of the stations also have intercity (long distance) transportation service, such as intercity bus, intercity rail, interstate ferries, or airline service.

David C. Warner

The San Diego rail station offers intermodal connections among (L-R) Amtrak intercity rail, Coaster commuter rail, the San Diego Trolley light rail, and (not seen in this photo) Metropolitan Transit System transit bus service. Intermodal connections are available at 70 percent of all stations served by commuter rail service.

Intermodal commuter rail stations offer residents within the commuter rail service area a way to use the trains to connect to region- and nation-wide destinations. Not only do these intermodal commuter rail stations provide the opportunity to connect between modes, but by offering multiple modes in a single location they help create more livable communities by offering multiple travel mode choices in a single location to the residents of the immediate surrounding areas.

[1] Intercity rail and commuter rail are by definition the same mode (Standard Rail—See Box A). There are four additional stations, not included in the 812, that are served only by commuter rail and intercity rail with no other modes present at those stations. While those four stations do not offer intermodal connections as defined in the Intermodal Passenger Connectivity Database, the ability to transfer between commuter and intercity rail offers travelers the same benefits as other transit/intercity intermodal connections.

[2] Recently, 1,067 commuter rail stations were added to the database. In addition, 92 intercity rail stations, already in the IPCD, are also served by commuter trains. One additional intercity rail station already in the database (Springfield, VA) is no longer served by intercity rail but is still served by commuter rail.

[3] Metropolitan areas are classified by the U.S. Census Bureau as either metropolitan or micropolitan Core Based Statistical Areas (CBSA's). All of the CBSA's served by the U.S. commuter rail network are metropolitan in nature. A metro area contains a core urban area of 50,000 or more population, and a micro area contains an urban core of at least 10,000 (but less than 50,000) population.

[4] In many cases, the local transit bus system is operated by the same transit authority that operates the commuter rail network.

Box A: How are Modes Defined?

The Intermodal Passenger Connectivity Database categorizes scheduled passenger transportation services by five major mode categories and a total of 11 subcategories. The major categories and their sub-categories are:

Mode	Sub-categories
Air	Air service
Bus	Intercity bus
	Transit bus
	Code share bus
	Supplemental bus
Ferry	Intercity ferry
	Transit ferry
Standard rail	Commuter rail
	Intercity rail
Transit rail	Heavy rail
	Light rail

Most of the analyses presented in this report discuss connections to the major mode categories shown above. However, the report also examines connections between intercity and transit modes. The intercity and transit modes include the following sub-categories of service:

Intercity	Transit
Air service	Transit bus
Intercity bus	Code Share bus
Code share bus	Supplemental bus
Supplemental bus	Transit ferry
Intercity ferry	Commuter rail
Intercity rail	Heavy rail
	Light rail

NOTE: Code share and supplemental bus may provide intercity or transit service depending upon whether it code-shares with, or supplements service for, an intercity mode or a transit mode.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics.

Connecting Options at Commuter Rail Stations

Of the 812 commuter rail stations where intermodal connections are available, 734 (90 percent) have connections with a single other mode. Transit bus is the connecting mode at 723 of those 734 stations. At 75 stations there are two modes connecting to commuter rail, and three stations are served by three modes in addition to rail.[5]

In addition to the 812 commuter rail stations with connections to other modes, there are also 79 stations that are classified as having "near connections." In these cases, there are no modes other than commuter rail directly serving the train station, but service from another modal subcategory stops within one or two blocks. Due to the physical separation of the modes they are not classified in the IPCD as connecting. The IPCD only classifies service in the same building or services located adjacent to each other as an intermodal connection. However, when connections are located within a few blocks of each other, they are considered a "near connection." Although not classified as a connection, many travelers may attempt to connect between the nearby modes.[6]

In addition to the stations with intermodal connections and those with nearby connections, there are 55 stations where other modes serve the community but not at or near the commuter rail station. Table 1 outlines the availability of connections to each of the other modes at stations in the commuter rail network.

There are 214 commuter rail stations in communities that have no other scheduled passenger transportation facility; clearly intermodal connections are not possible in these locations. When only commuter rail stations in communities with other transportation modes are considered, the percentage of stations with intermodal links goes up to 86 percent from the overall 70 percent mark.

Buses and intercity rail are the most highly connected modes with commuter rail. Commuter rail connects with transit bus in nearly 86 percent of commuter rail communities where transit bus service is present in addition to commuter rail. Code share buses and supplemental buses, two special categories of bus service operated as elements of an intermodal transportation system, connect with commuter rail in almost 90 percent of communities they both serve. The code share and supplemental bus services are discussed in more detail below in the section on links to intercity transportation.

Intercity rail shares 92 stations with commuter rail and is connected in 86 percent of all communities served by both intercity and commuter rail. Figure 1, shows the degree of connectivity between commuter rail and each of the other categories of scheduled passenger service, considering only communities where both modes are located.

[5] The three stations served by three modes in addition to standard rail service are Hoboken, NJ (transit rail, transit bus and transit ferries), O'Hare Airport Transfer Station (transit rail, transit and intercity bus, and air service), and BWI Thurgood Marshall Airport (transit rail, transit bus and air service). BWI is also served by intercity rail, but for purposes of identifying major modes of passenger transportation, intercity rail and commuter rail are both considered the same mode (standard rail). See Box A.

[6] The BTS Technical Report, *The Background, Criteria, and Usage of the Intermodal Passenger Connectivity Database*, February 2009, discusses how connections and near connections are determined.

Table 1: Number of Commuter Rail Stations With Connections to Intercity and Transit Modes

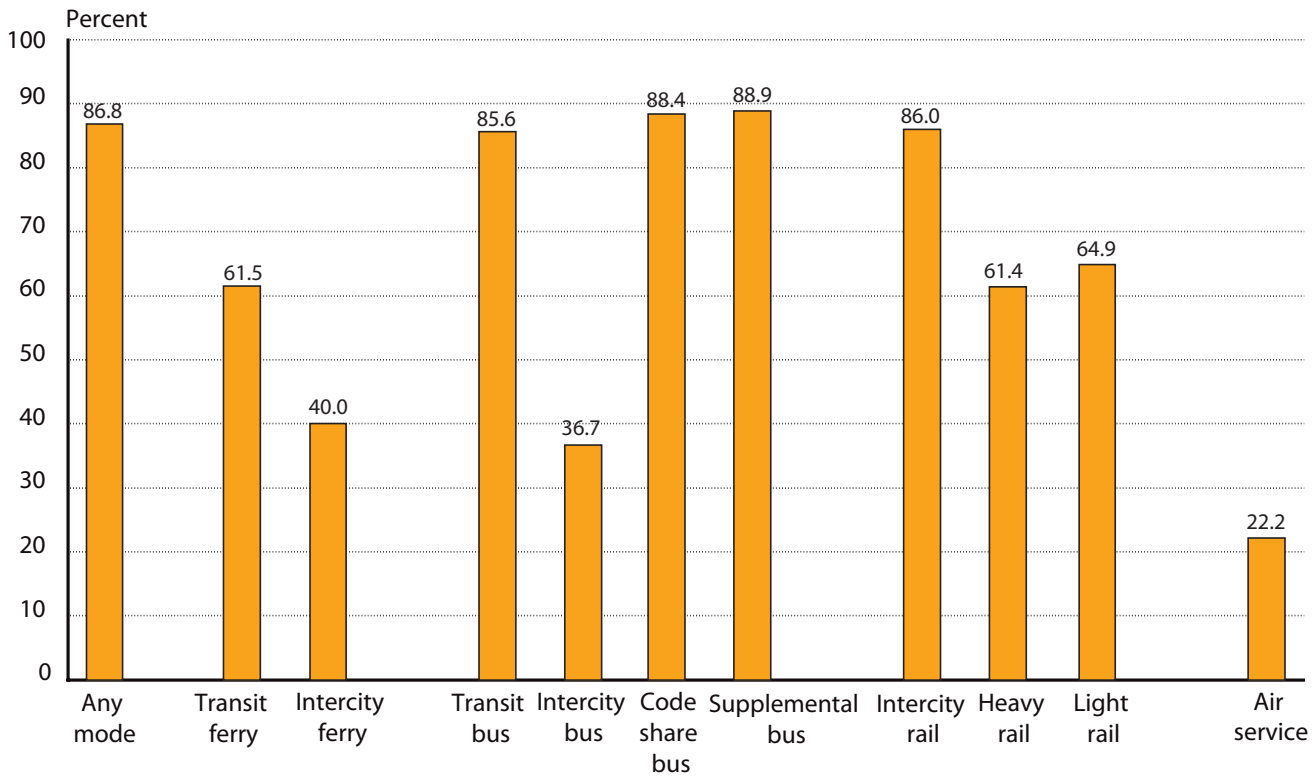
Connecting mode	Connections	Near connections	No connection	No service
Intercity modes				
Bus	40	7	62	1051
Rail	92	2	13	1053
Ferry	2	0	3	1155
Air	11	1	31	1117
Transit modes				
Bus	801	80	55	224
Rail (Heavy & Light Rail)	62	16	14	1068
Ferry	8	2	3	1147
All modes	**812**	**79**	**55**	**214**

NOTES: This table shows the status of connections between commuter rail and the various intercity and transit modes at 1,160 commuter rail stations. For each mode listed in the leftmost column, read across to see how many commuter rail stations fall into each of the four connecting status categories. "Connections" indicates the number of commuter rail stations where the mode listed is either in the commuter rail station, directly outside, or within one block. "Near connections" means the connecting mode is within 1-2 blocks or is in the commuter rail station but operates during hours that commuter rail does not. "No connection" means the mode shown serves the same town/city/ municipality as commuter rail, but does not serve the commuter rail station nor comes close enough to be considered a "near connection." "No service" shows the number of commuter rail stations where the other mode does not serve the same town/city/municipality as the commuter rail station.

Supplemental and Code Share buses that are in the database are not included in the totals in this table since they are not classified in the database as either intercity or transit.

SOURCE: Intermodal Passenger Connectivity Database, U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transporation Statistics. Retrieved from http://www.bts.gov/ on Oct. 8, 2010.

Figure 1: Percent of Commuter Rail Stations with Connections to Other Modes in Communities Where Both Commuter Rail and the Other Mode Operate



SOURCE: Intermodal Passenger Connectivity Database, U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics. Retrieved from http://www.bts.gov/ on Oct. 8, 2010.

Table 2: Intermodal Connectivity for Intercity and Commuter Rail Stations

	With connectivity		Connect with one other mode		Connect with two modes		Connect with three modes		No connectivity		Total stations
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
Intercity Rail Stations											
All stations served by intercity rail	277	52.4	243	45.9	33	6.2	1	0.2	252	47.6	529
Stations w/intercity only	189	43.2	181	41.4	8	1.8	0	0.0	248	56.8	437
Commuter Rail Stations											
All stations served by commuter rail	812	70.0	734	63.3	75	6.5	3	0.3	348	30.0	1160
Stations w/commuter rail only	724	67.8	672	57.9	50	4.3	2	0.2	344	29.7	1068
Joint Intercity/Commuter Stations	88	95.7	62	67.4	25	27.2	1	1.1	4	4.3	92

SOURCE: Intermodal Passenger Connectivity Database, U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transporation Statistics. Retrieved from http://www.bts.gov/ on Oct. 8, 2010.

Commuter Rail and Intercity Rail Connectivity Compared

Connectivity at the 1,160 commuter rail stations is much higher than connectivity at the intercity rail stations examined in a previously issued BTS Special Report.[7] Connections to bus, transit rail, ferry or air service are present at 70 percent of stations served by commuter rail, but at only 52 percent of stations served by intercity rail. The figures for commuter and intercity include the 92 stations that are served by both of these categories of rail service. Stations served solely by commuter rail also are more likely to have connectivity with other modes (68 percent) than stations served by intercity rail only (43 percent). However, the highest degree of connectivity is at rail stations served by both intercity and commuter rail. Other modes serve 96 percent of jointly served commuter and intercity rail stations.

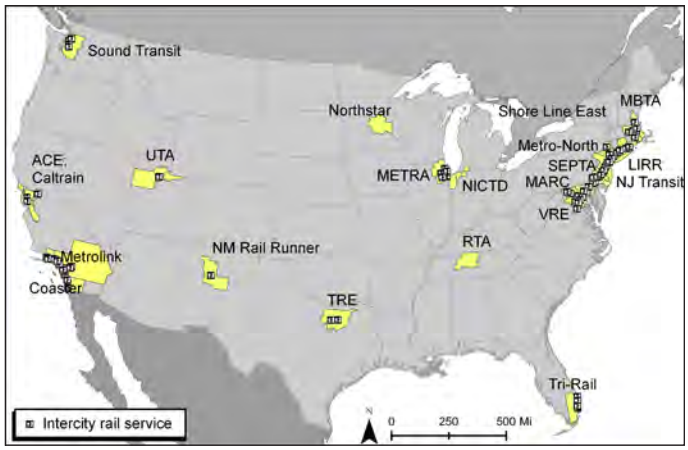
Table 2 shows the connectivity for intercity, commuter, and the 92 stations that are jointly served by both intercity and commuter rail service.

Links to Intercity Transportation

Commuter rail serves 111 stations where passengers can make connections to intercity transportation modes. The most prevalent connection with intercity transportation is to intercity rail service operated by Amtrak, since commuter and intercity rail operate over the same tracks and serve the same stations at 92 locations. Figure 2 shows the metro areas where commuter rail operates, and the stations with commuter rail/intercity rail connections.

Even though nonrail intercity modes do not serve rail stations as their primary terminal, transfer can also be made at some locations to interstate ferries, intercity buses, and airline service. There are 40 stations with connections to intercity bus, 11 with connections to air service, and 2 with connections to interstate ferries, as well as the 92 stations with connections to intercity rail. Some stations have links to more than one intercity mode.

Figure 2: Connections Between Commuter and Intercity Rail Trains



NOTE: Highlighting on the map indicates the boundaries of the metropolitan areas served by commuter rail.

SOURCE: Intermodal Passenger Connectivity Database, U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics. Retrieved from http://www.bts.gov/ on Oct. 8, 2010.

Ferry Connections

At two locations, both in Connecticut, commuter rail passengers can connect to intercity ferry service. At Bridgeport (served by Metro-North and Shoreline East commuter trains) ferries depart from the adjacent pier en route across Long Island Sound to Port Jefferson. At New London (served by Shoreline East), Long Island Sound ferries depart for Orient Point, Fisher's Island, and Block Island. Commuter rail passengers can also connect with transit (local) ferries at seven stations—three in New York State (Beacon, Greenport, and Ossining); Hoboken, NJ; the two main stations in Chicago (Union Station and Oglivie Transportation Center); and two in Washington State (Edmonds

[7] See Making Connections: Intermodal Links in the Public Transportation System, a BTS Special Report, at http://www.bts.gov/publications/special_reports_and_issue_briefs/special_report/2007_09_18/html/entire.html. At the time that report was issued there were 528 intercity rail stations in the database; there are currently 529.

and Mukilteo). Figure 3 shows commuter rail connections with both interstate and transit ferries.

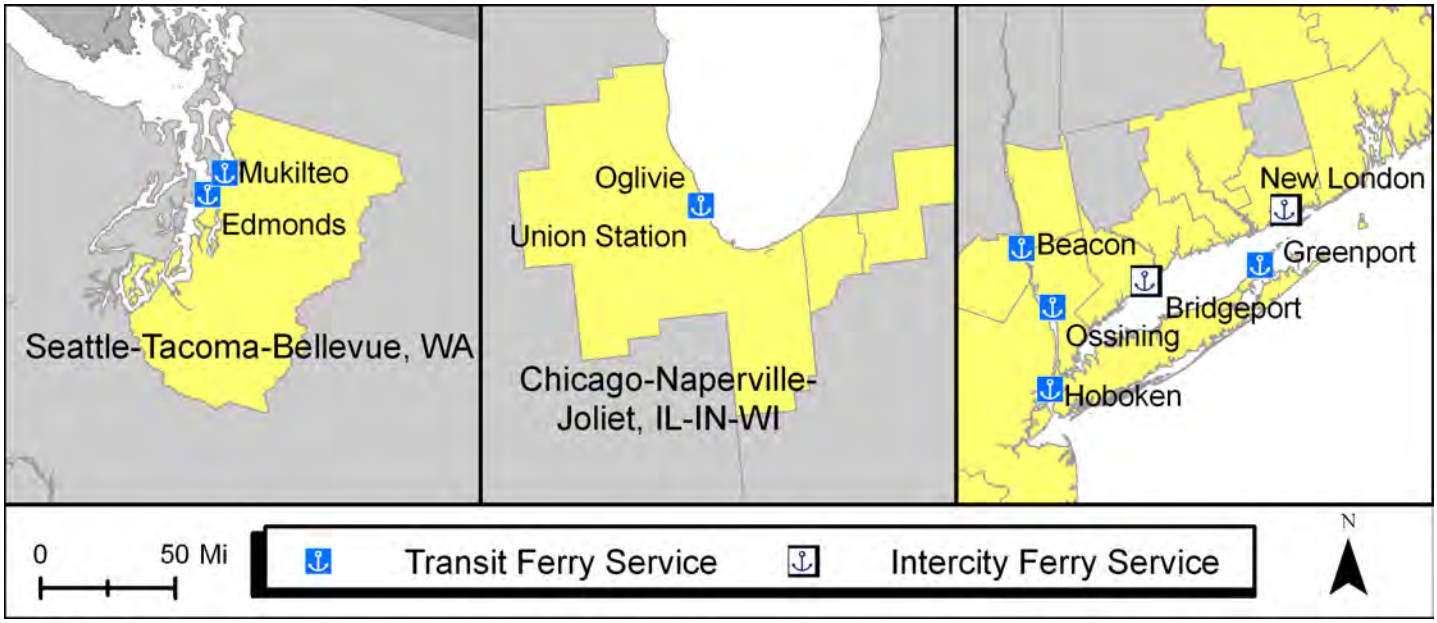
Commuter Rail at Airports

Commuter rail provides service to 8 airports, through 11 commuter rail stations. At two of those airports, South Bend, IN, and Philadelphia, PA, trains operate directly to the airport terminal via an adjacent rail station. Philadelphia International Airport has four commuter rail stations allowing trains to directly serve each of the airport terminals.

Four airports have commuter rail stations located physically away from the airport terminal, but linked to the airport terminal by the intra-airport transportation system. The Fort Lauderdale/Hollywood, FL, International Airport is served via the nearby Tri-Rail Station, where Tri-Rail operates its own shuttle to the airport terminal. Table 3 lists airport commuter rail stations.

If a rail station is not physically in the airport terminal, a direct connection with air service is provided when the rail service is linked to the airport terminal building either by the

Figure 3: Connections Between Commuter Rail and Ferry Services



NOTE: Highlighting on the map indicates the boundaries of the metropolitan areas served by commuter rail.

SOURCE: Intermodal Passenger Connectivity Database, U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics. Retrieved from http://www.bts.gov/ on Oct. 8, 2010.

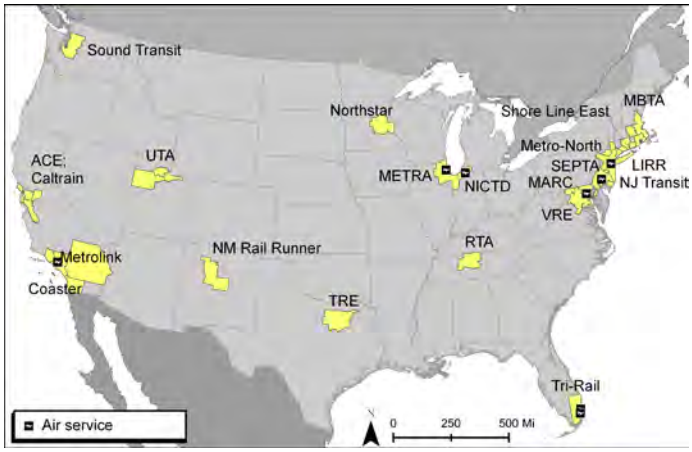
Table 3: Commuter Rail Stations at US Airline Airports

Airport	State	Commuter Rail Operator	Link to Airport Terminals and Other Modes	Also Served by Intercity Rail
Burbank	CA	Metrolink	Airport Parking lot shuttle	Amtrak
Chicago O'Hare	IL	Metra	Airport Transit System train	No
South Bend	IN	South Shore Line	Station next to air terminal	No
Miami International	FL	Tri-Rail	Tri-Rail Airport Shuttle Bus	No
Fort Lauderdale/Hollywood	FL	Tri-Rail	Tri-Rail Airport Shuttle Bus	No
Baltimore/Washington Thurgood Marshall	MD	MARC	Airport Parking lot shuttle	Amtrak
Newark Liberty International	NJ	NJ Transit	Airport monorail system	Amtrak
Philadelphia International	PA	SEPTA	Four airport rail stations adjacent to each of the airline terminals	No

NOTE: Commuter rail stations are those served by regional trains operating on the tracks of the national rail network. Subway and streetcar-type trains that serve airports (such as the Washington Metro at Ronald Reagan National Airport, Washington, DC or the Cleveland RTA Red Line at Cleveland, OH Hopkins Airport) are considered heavy and light rail sevice and will be examined in a subsequent report.

SOURCE: Intermodal Passenger Connectivity Database, U.S. Department of Transportation, Research and Innovative Technology Administraton, Bureau of Transportation Statistics. Retrieved from http://www.bts.gov/ on October 8, 2010.

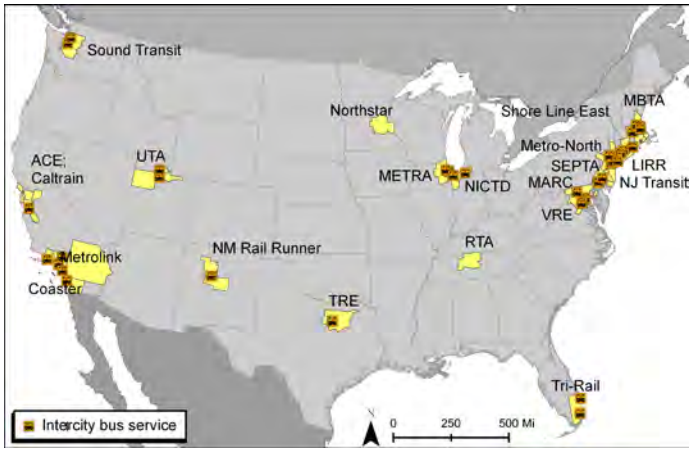
Figure 4: Connections Between Commuter Rail and Airline Service



NOTE: Highlighting on the map indicates the boundaries of the metropolitan areas served by commuter rail.

SOURCE: Intermodal Passenger Connectivity Database, U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics. Retrieved from http://www.bts.gov/ on Oct. 8, 2010.

Figure 5: Connections between Commuter Rail and Intercity Buses



NOTE: Highlighting on the map indicates the boundaries of the metropolitan areas served by commuter rail.

SOURCE: Intermodal Passenger Connectivity Database, U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics. Retrieved from http://www.bts.gov/ on Oct. 8, 2010.

airport's own intra-airport transportation system, or a shuttle operated by the rail service operator. However, a commuter rail service that is linked to an airport terminal only by a third party service provider (e.g., a local transit bus) is not considered to provide a direct connection with air service. The criteria for determining connectivity can be found in the BTS Technical Report: *The Background, Criteria, and Usage of the Intermodal Passenger Connectivity Database*, April 2007.[8]

[8] This report can be found at www.bts.gov/publications/bts_technical_report/2009_007/pdf/entire.pdf.

Table 3 and figure 4 show connections between commuter rail and airline service as of October 8, 2010. A new commuter rail station at the Providence, RI, airport is scheduled to open in fall 2010.

Links With Intercity Buses

Other than intercity rail, intercity bus offers the most intercity connectivity for commuter rail passengers. Commuter rail passengers can directly connect at 40 stations to intercity buses, and at 7 locations where intercity bus is within 1–2 blocks of the rail station. Unconstrained by a fixed right of way, intercity bus has the flexibility to move into intermodal facilities that are often planned around rail stations. Nevertheless, 62 commuter rail service communities are also served by intercity bus, yet the bus does not connect with the commuter trains. Frequently, intercity bus operators prefer to serve locations at or near interstate highway exits to result in the fastest possible travel time for through travelers aboard the buses. Figure 5 shows locations where commuter rail and intercity bus connect.

Code Share and Supplemental Bus Service

Code share buses and supplemental buses are special bus service categories operated specifically as elements of an intermodal transportation system. Code share buses operate as connections to another mode—predominantly as connections to intercity rail from communities that are not directly served by trains. The largest concentration of these services is in California. Some code share bus service is also operated in conjunction with commuter rail service, and there is limited airline code share bus service. In cities served by both commuter rail and code share bus, the commuter train usually serves the intercity rail station, which is where the code share bus usually operates. Thus, the degree of connectivity is high with code share bus is high, even though the code share bus is operated as a connection to intercity rail.

Another class of intermodal bus service is the supplemental bus. A supplemental bus operates along a rail route as an additional frequency to supplement the rail service. Just as with code share buses, the degree of connectivity with commuter rail for supplemental bus is high, because commuter rail is normally using the same rail station as the intercity rail for which the supplemental bus is operated.

A future fact sheet will be issued to provide a more in-depth look at code share and supplemental bus services.

Possibility of Additional Connections

While commuter rail has a higher percentage of connections at its stations than the other modes in the IPCD, there are 79 commuter rail stations served only by commuter trains even though another mode has service within a few blocks. At 78 of those stations, the other mode is transit or intercity bus. The bus modes have greater flexibility than

Table 4: Intermodal Passenger Connectivity Database Summary by Facility Type (Number of facilities)

	48 contiguous States	Alaska & Hawaii	Total
Airports	434	237	671
With intermodal connections	148	11	159
Without intermodal connections	286	226	512
Percent with connections	34.1%	4.6%	23.7%
Intercity rail stations	507	22	529
With intermodal connections	271	6	277
Without intermodal connections	236	16	252
Percent with connections	53.5%	27.3%	52.4%
Commuter rail stations	1160	0	1160
With intermodal connections	812	0	812
Without intermodal connections	348	0	348
Percent with connections	70.0%	N/A	70.0%
Passenger ferry terminals	256	42	298
With intermodal connections	112	10	122
Without intermodal connections	144	32	176
Percent with connections	43.8%	23.8%	40.9%
Total, all facilities in the Intermodal Connectivity Database	2,265	301	2,566
With intermodal connections	1,255	27	1,282
Without intermodal connections	1,010	274	1,284
Percent with connections	55.4%	9.0%	50.0%

NOTES: There are 92 stations on the national rail network that are served by both intercity and commuter rail. Data for these 92 stations are included in both the commuter and intercity rail categories. However, these stations are counted only once in the totals at the bottom of this table.

The Intermodal Passenger Connectivity Database measures the connectivity between different modes of passenger transportation by counting the number of passenger transportation terminals and the availability of connections among the various scheduled public transportation modes at each facility.When facilities of more than one mode are co-located, the facility for each mode is counted separately for purposes of total facilities. However, rail stations on the national network that serve both intercity and commuter rail are included in the totals for each mode, but are counted only once in the totals at the bottom of the table.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, Intermodal Passenger Connectivity Database, October 2010.

most other modes to adjust their routes in order to establish intermodal connections.[9] Thus, with modifications to existing routes, an even greater percentage of commuter rail stations could have intermodal links. Additional intermodal links improve mobility for the traveling public and livability for the communities surrounding the station through increased transportation choices for community residents.

Updates to Earlier Data

With the addition of the commuter rail station connectivity data to the IPCD, a few ferry terminal and airport records are being updated to reflect new information available concerning the proximity of those facilities to commuter rail stations. The Bridgeport, CT, ferry terminal (Facility ID CT0660402 in the database) will now show a connection with commuter rail instead of a near connection, and the Mukilteo, WA, ferry terminal (WA9827501) will now show a near connection instead of no connection. Although the Centreport/Dallas-Fort Worth airport commuter rail station is connected to the airport terminal through the airport shuttle bus system, that system requires a change of shuttle buses to get to the terminal. Therefore, instead of finding that the airport has a direct connection with commuter rail, that connection will be classified as a near connection in both the commuter rail station record (TX7615501) and the existing database airport record (TX7526101).

Table 4 presents the most current data on the number and percentage of airline-served airports, intercity rail stations, ferry terminals, and commuter rail stations with intermodal connectivity. For the modes other than commuter rail, this data updates the numbers in the previous special reports issued for those modes. Those special reports are listed at the end of this report in the “About This Report” section.

Upcoming Connectivity Reports

With the addition of commuter rail station data to the IPCD, the database now includes 2,566 passenger transportation facilities (airports, intercity rail stations, ferry terminals, and commuter rail stations). The last modes to be added to the database, transit rail (heavy rail and light rail) and intercity bus are scheduled for addition to the database in late summer/early fall 2011.

[9] Since the rail mode must operate where tracks are located, airplanes can only land where airports are located, and ferries must operate where there is a body of water, they have less flexibility than buses to alter their routes. While buses have flexibility to adjust routes, in concept, various operating and economic considerations when a route is changed may in some cases outweigh for the bus operator the advantages of establishing new intermodal connections.

About This Report

This report was prepared by Bruce Goldberg, Transportation Specialist, in the Bureau of Transportation Statistics (BTS). Theresa Firestine, an economist in BTS, conducted Geospatial Information Systems analysis (GIS), prepared the maps used here, and conducted some of the analysis for this report. BTS is a component of the Department of Transportation's Research and Innovative Technology Administration.

This Special Report presents findings on the degree of connectivity offered by commuter rail services. Commuter rail data is the most recent addition to the BTS Intermodal Passenger Connectivity Database that is being developed as a nationwide data source of passenger transportation terminals and intermodal services provided at those terminals. This report also compares the commuter rail data with the data for intercity rail, airports and ferry terminals that were presented in Special Reports SR-004 (September 2007) and SR-012 (February 2009).

For copies of the BTS Special Report or questions about this or other BTS reports, call 1-800-853-1351, email RITAinfo@dot.gov, or visit www.bts.gov.

For related BTS data and publications

Data—

- Intermodal Passenger Connectivity Database at http://www.transtats.bts.gov/DatabaseInfo.asp?DB_ID=640&DB_URL=Subject_ID=3&Subject_Desc=Passenger%20Travel&Mode_ID2=0

- National Transportation Atlas Database: Intermodal Terminal Facilities—the freight counterpart to the Intermodal Passenger Connectivity Database.

Related BTS Publications—

- *Making Connections: Intermodal Links in the Public Transportation System,* Bureau of Transportation Statistics, Special Report SR-004, September 2007.

- *The Background, Criteria, and Usage of the Intermodal Passenger Connectivity Database,* Bureau of Transportation Statistics, Technical Report TR-007 , February 2009.

- *Making Connections: Intermodal Links Between Scheduled Passenger Ferries and Other Public Transportation Modes,* Bureau of Transportation Statistics, Special Report, SR-012, February 2009.