

Scheduled Intercity Transportation: Rural Service Areas in the United States

June 2005



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



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U.S. Department of Transportation
400 Seventh Street, SW, Room 4117
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U.S. Department of Transportation

Norman Y. Mineta
Secretary

Maria Cino
Deputy Secretary

Research and Innovative Technology Administration

Eric C. Peterson
Deputy Administrator

Bureau of Transportation Statistics

Rick Kowalewski
Deputy Director

William J. Chang
*Associate Director for
Information Systems*

Mary J. Hutzler
*Associate Director for
Statistical Programs*

William Bannister
*Assistant Director for
Advanced Studies*

Wendell Fletcher
*Assistant Director for
Transportation Analysis*

Project Manager
Bruce Goldberg

Major Contributors

Carol Brandt
Derald Dudley
Michele Janis
Steve Lewis
Amanda Moritz
Christopher Thomas
Jose Vargas
Joseph Workman

Editor
William Moore

Report Layout and Cover Design
Dorinda Edmondson

What's New in This Edition

This edition of *Scheduled Intercity Transportation: Rural Service Areas in the United States* updates the edition dated September 2004. Analysis for this edition includes the following:

- Discontinuance of Amtrak's Three Rivers train route between Pittsburgh, Pennsylvania and Chicago, Illinois.
- The second stage of Greyhound Lines' route restructuring on April 3, 2005 that resulted in the discontinuance of all intercity bus service at 112 locations in the Southwest and South Central sections of the country.
- Inclusion of year-round scheduled intercity bus or bus/van services in Alaska.
- Inclusion of the Alaska Marine Highway System ferries that provide service among Alaska coastal communities and to/from Bellingham, Washington.
- Updating to reflect other miscellaneous additions and deletions of air, rail, and bus service at locations around the United States.
- Correction of a number of omissions of airports, rail stations, and bus stations discovered during the updating process. The most significant number of additions were in Alaska where 76 airports not previously included as scheduled service airports were added to the analysis.

Additionally, the projection method used in the geospatial information system analysis for this report has been modified to produce more consistent results when updating. In some cases the change in the method used to project the service area around an intercity transportation facility has resulted in one-time changes to the number of rural residents served by a specific mode even in states where there has been no change in the service provided since the last report. The new projection method is expected to ensure consistency in future updates to this report.

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Rural Scheduled Intercity Transportation

Mobility for rural America is an important transportation issue. Besides regional access to nearby metropolitan areas, rural residents are also concerned with their ability to make long-distance intercity trips by commercial transportation. Over the last few years there has been a growing concern about reduction of rural intercity transportation services. The current financial challenges for many of the nation's transportation carriers and resulting reductions in service have focused further attention on the mobility issue for rural areas.

To identify how many of the country's 82.4 million rural residents are within the reasonable coverage radius of at least one intercity transportation facility, in 2003 the Bureau of Transportation Statistics (BTS) undertook a geospatial analysis using Geographic Information System (GIS) tools to plot these facilities. Reasonable coverage radius was defined as 25 miles around bus and rail stations and smaller airports. For medium and large hub airports, the study used a wider 75-mile coverage radius. These parameters are based on commonly used assumptions within the passenger transportation industry and previous work done by BTS and the Office of the Secretary of Transportation.¹

The initial geospatial analysis plotted all intercity railroad stations², airports with scheduled airline service, and intercity bus service locations as of January 15, 2003. The 25-mile or 75-mile reasonable coverage radius, as appropriate, was plotted around each facility to develop a nationwide picture of intercity transportation coverage. This report is the latest update to that original report. An update in September 2004 took into account changes that occurred in the intercity bus network in August 2004 when Greyhound implemented the first phase of its network restructuring. Since that update was issued, Amtrak has discontinued service over a portion of one of its long-distance routes; Greyhound has implemented the next phase of its network restructuring, dropping service at 148 locations on April 3,

¹ B.D. Spear and R.W. Weil, "Access to Intercity Transportation Services from Small Communities: A Geospatial Analysis," Transportation Research Record 1666 (Washington, DC: Transportation Research Board, 1999).

² Amtrak and the Alaska Railroad.

2005; and several other changes in air, rail, and intercity bus service have occurred.³ This report reflects these changes and adds several intercity bus services in Alaska as well as the Alaska Marine Highway System (ferries) to develop this current nationwide picture of intercity transportation coverage in rural areas.⁴ A complete set of intercity rural transportation maps developed as part of this analysis can be found at http://www.bts.gov/publications/scheduled_intercity_transportation_and_the_us_rural_population/. Methodology information can be found at the end of this report.

TABLE 1
Scheduled Intercity Transportation Coverage for Rural Residents

	Rural residents (millions)
Total rural population	82.4
Covered by at least one mode	76.5
- Covered by one mode only	16.4
- Covered by two modes	31.0
- Covered by three modes	29.0
- Covered by four modes	<0.1
Not covered by any mode	5.9

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

any of the scheduled intercity modes (table 1). Intercity bus has the greatest penetration into rural areas with 89 percent of the rural residents in the coverage area. Air service covers 71 percent, and intercity rail covers 42 percent. Figure 1 shows the percentage of the population covered by each mode for the contiguous 48 States, Alaska, Hawaii, and all 50 states combined.

For each of the modes this report discusses the extent of the intercity network available in rural areas and the number of rural residents who are within the coverage area of the mode. The report also examines the extent to which each mode provides the only intercity transportation available to rural residents. Table 2 shows the coverage that each mode provides to rural residents.

RURAL COVERAGE

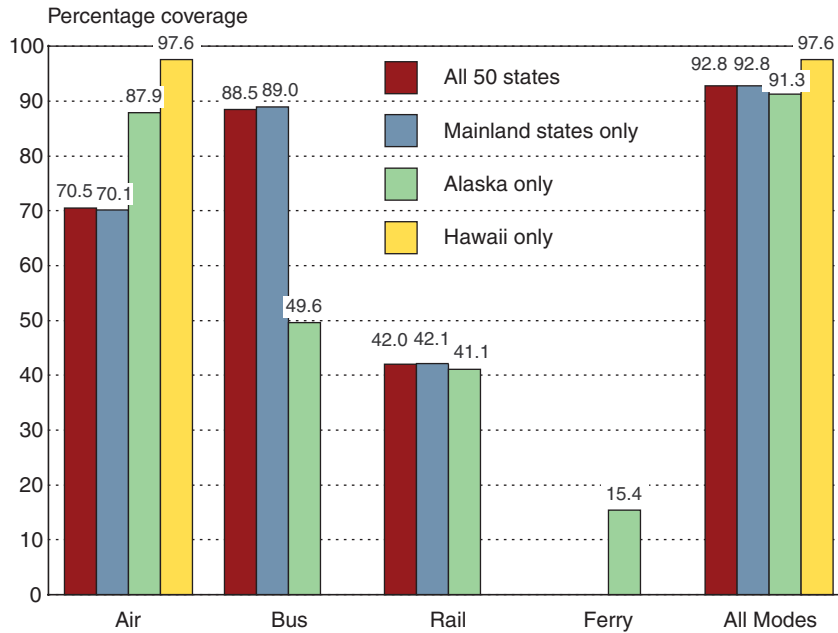
Using census block group information, BTS calculated that 76.5 million (93 percent) of the 82.4 million rural residents in the United States live within the coverage area of at least one of the four intercity public transportation modes (air, bus, rail, ferry). Of those 76.5 million, over three-fourths have access to more than one mode. There are 5.9 million residents (7 percent) who do not live within the coverage area of

³ This report also adds 75 airports in Alaska and several airports and rail stations across the country that were not included in the prior analysis due to previously undiscovered data issues. The percentage of the rural population covered by air service increases from 57 percent to 97 percent in Hawaii and from 84 percent to 88 percent in Alaska. The report also adds several rail and bus stations and updates information for locations where airline service has relocated to other facilities since the original database was developed.

⁴ While U.S. ferry services do not generally provide intercity passenger service, the role of the Alaska Marine Highway System (AMHS) in providing city-to-city service along the Alaska coast and long distance passenger service between Alaska points and Bellingham, Washington, qualifies the AMHS as an intercity travel mode.

FIGURE 1

Rural Population Coverage by Mode and Geographic Area



NOTE: There is no bus or rail service in Hawaii. Ferry data is shown only for Alaska as it represents only 0.1% coverage nationally.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

TABLE 2

Scheduled Rural Intercity Transportation Coverage by Mode

	Air	Rail	Bus	Ferry
Total rural population coverage (millions)	58.0	34.6	72.9	0.1
Percent of rural population covered	70.5%	42.0%	88.5%	0.1%
Sole mode for rural population (millions)	2.4	0.3	14.4	<0.1
Number of states by percent of population covered				
- 100% of rural population	4	1	2	0
- 90-99% of rural population	3	1	20	0
- 80-89% of rural population	8	1	10	0
- 70-79% of rural population	7	3	12	0
- 60-69% of rural population	13	5	1	0
- 50-59% of rural population	7	3	3	0
- 40-49% of rural population	5	9	1	0
- 30-39% of rural population	3	8	0	0
- 20-29% of rural population	0	11	0	0
- 1-19% of rural population	0	5	0	2
- No coverage of rural population	0	3	1	48

NOTE: Interstate ferry service is the sole accessible mode of intercity transportation for 1,877 rural Alaska residents.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

TABLE 3
Scheduled Intercity Service Locations

	Airports	Rail stations	Intercity bus stations	Interstate ferry terminals	Total facilities
Mainland states	432	520	3,157	1	4,110
Alaska	195	20	22	30	267
Hawaii	11	—	—	—	11
Total	638	540	3,179	31	4,388

NOTE: Based on scheduled services provided on Apr. 3, 2005.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

INTERCITY SERVICE LOCATIONS

As of April 3, 2005, there were a total of 4,388 intercity passenger locations, 4,110 of which are located within the 48 mainland states. There were 3,179 intercity bus stations, 638 airports, and 540 rail stations in the United States (table 3).

The intercity transportation facilities serving rural areas are not necessarily located in the rural location being served. In some cases the facility is in another nearby rural community. In rural areas surrounding major metropolitan areas, the rural residents may fall within the coverage area of an airport or ground transportation terminal that is in a nearby urbanized area.

Intercity Rail, Bus, and Air Service Providers

Numerous air and bus carriers provide intercity transportation to rural areas. Two carriers, Amtrak in the mainland United States and the Alaska Railroad, provide intercity rail service. There are many other rail transit carriers (e.g., New Jersey Transit, Chicago's METRA, and California's Caltrain to name a few). However, they provide local or regional transit service and thus are not included in the BTS study as intercity transportation providers.

The largest intercity bus carrier is Greyhound Lines, Inc., which carries an estimated 60 percent of the scheduled intercity bus traffic in the United States. Although only 12 Class 1 bus carriers⁵ report their scheduled intercity traffic to the Federal Motor Carrier Safety Administration,⁶ there are about 50 carriers who provide scheduled intercity service, most on a regional basis. For the most part, intercity bus carriers offer interline ticketing and connecting schedules that collectively provide an integrated network in the 48 mainland states. Starting with this edition of the report, we are including several regularly scheduled bus or van services in Alaska in the analysis.

⁵ Class 1 motor carriers of passengers are those with at least \$5 million in annual passenger revenue.

⁶ Motor carrier data, which prior to Sept. 29, 2004, was reported to BTS, can be found at <http://www.fmcsa.dot.gov/reporting/prod.htm>.

Airports served by regularly scheduled air carriers were included in this study. Among those airports are those in rural areas that receive their service under the federal Essential Air Service (EAS) Program.⁷ Subsidized EAS is provided at 109 communities in the contiguous United States, 33 in Alaska, and 3 in Hawaii.⁸

Interstate Ferries

Starting with this edition of the report, we are including the Alaska Marine Highway System (AMHS) whose ferries connect 31 coastal cities in Alaska with each other and with Bellingham, Washington. At Bellingham, AMHS connects with both Amtrak and intercity bus service. While there are other ferry services in the United States, many are local or regional in nature, more akin to transit service. In fact many are operated by transit agencies. Many operate only seasonally. Ferries that primarily carry passengers in their automobiles, rather than providing a link for individual public transportation travel, are more akin to being a “floating highway.” Therefore, AMHS is the only ferry service we are including as rural scheduled intercity transportation. A complete inventory of ferry services can be found in the National Ferry Database compiled by the Federal Highway Administration.⁹

THE MODES

Intercity Bus

Intercity bus has the deepest penetration of the four modes within rural America. Dominated by a single nationwide carrier, Greyhound Lines, Inc., but with about 50 carriers altogether, the intercity bus industry serves nearly 3,200 stations. The recent discontinuation of some intercity bus routes has raised concerns about service to rural areas. Nevertheless, the intercity bus network still covers 88.5 percent of the total U.S. rural population and 89.0 percent of the rural population in the 48 contiguous states. Some state governments provide funds for intercity bus services through the Federal Transit Administration Section 5311(f) formula grants program.¹⁰ In most states, intercity bus serves a greater share of the rural population than the other modes. The only exceptions are in several Northeast states where air or rail service covers a slightly higher percentage of the population and in Alaska where air service has much deeper penetration of rural areas. Details by state and region are discussed later in this report.

⁷ For background on the Essential Air Service program, see <http://ostpxweb.dot.gov/aviation/rural/easwhat.pdf>.

⁸ As of April 2005, per personal communication with the Essential Air Service Division in the Office of Aviation Analysis, U.S. Department of Transportation, Apr. 19, 2005. In addition, one EAS point is also subsidized in Puerto Rico, which is not covered in this report.

⁹ The database can be found at the BTS TranStats homepage at <http://www.transtats.bts.gov>.

¹⁰ Funding for the 5311(f) program is provided through the Federal Transit Administration. See <http://www.fta.dot.gov/library/policy/prgms/nuafg.html>.

TABLE 4

States with Greatest and Least Intercity Bus Coverage**Highest percent rural intercity bus coverage by state**

	Rural population	Coverage	Percent covered
Connecticut	595,174	595,174	100.0%
Delaware	275,710	275,710	100.0%
Vermont	448,107	447,029	99.8%
Massachusetts	887,715	884,431	99.6%
Rhode Island	175,457	174,555	99.5%
Pennsylvania	3,555,412	3,529,691	99.3%
Florida	3,618,587	3,555,975	98.3%
New York	3,541,133	3,434,638	97.0%
South Carolina	2,035,045	1,969,738	96.8%
Texas	5,427,408	5,225,493	96.3%

Lowest percent rural intercity bus coverage by state

	Rural population	Coverage	Percent covered
Hawaii	363,545	0	0.0%
Alaska	305,546	151,685	49.6%
North Dakota	343,379	177,223	51.6%
Nebraska	685,274	394,044	57.5%
South Dakota	481,959	288,873	59.9%
Montana	506,692	335,316	66.2%
Wyoming	259,459	181,837	70.1%
Kansas	1,066,777	756,288	70.9%
Kentucky	2,191,907	1,555,319	71.0%
Arkansas	1,645,360	1,214,267	73.8%

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

The intercity bus industry covers 100 percent of the rural population in two states (Connecticut and Delaware), over 90 percent in an additional 20 states, and over 80 percent in another 10 states. There are only four mainland states where less than 70 percent of the rural population has intercity bus access, but even in these states bus covers more of the population than the other modes.

Table 4 shows the states with the greatest and lowest percentage of rural residents covered by intercity bus transportation.

Approximately one in five rural residents who have access to intercity transportation (16.4 million) is within the coverage area of only a single intercity mode. For most of those people (13.5 million), intercity bus provides the sole access to commercial intercity transportation. The number of rural residents for whom bus service is the sole intercity access can be found, by state, in table 11.

Air Service

Among the three commercial intercity modes, airlines carry the most long-distance travelers. According to the 2001 National Household Travel Survey, conducted by BTS and the Federal Highway Administration, 70 percent of long-distance trips not

TABLE 5

States with Greatest and Least Air Service Coverage**Highest rural air service coverage by state**

	Rural population	Coverage	Percent covered
Connecticut	595,174	595,174	100.0%
Massachusetts	887,715	887,715	100.0%
New Jersey	846,452	846,452	100.0%
Rhode Island	175,457	175,457	100.0%
Hawaii	363,545	354,950	97.6%
Maryland	1,079,420	1,013,229	93.9%
Florida	3,618,587	3,269,172	90.3%
Ohio	3,341,447	2,969,838	88.9%
Alaska	305,546	268,638	87.9%
California	3,835,613	3,309,342	86.3%

Lowest rural air service coverage by state

	Rural population	Coverage	Percent covered
Alabama	2,431,865	794,826	32.7%
Wyoming	259,459	91,716	35.3%
Oklahoma	1,575,634	558,156	35.4%
North Dakota	343,379	132,518	38.6%
Montana	506,692	205,553	40.6%
South Dakota	481,959	205,931	42.7%
Iowa	1,548,051	678,307	43.8%
Idaho	624,767	289,133	46.3%
Arkansas	1,645,360	820,220	49.9%
New Mexico	698,221	367,446	52.6%

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

taken by personal vehicle are taken by air (7.4 percent of all long distance trips).¹¹ Airlines provide scheduled service at a total of 638 airports in the United States—432 airports in the mainland states, 195 in Alaska, and 11 in Hawaii.

Airline service covers 71 percent of those who live in rural America. In 15 states at least 80 percent of rural residents are covered by air service, including 4 Northeast states where all rural residents are covered. There are 42 states in which at least half of the rural population is in the airline service area. Table 5 shows the states with the greatest and least percentage of rural residents covered by scheduled air service.

Air service is the sole intercity transportation mode for 2.6 million rural residents, or 3.1 percent of the rural population. Other than Hawaii, where air service is the only intercity mode, Alaska is the state with the highest percentage of rural residents that have access only to air with no access to the other modes. In Alaska, 26 percent of rural residents are served only by air. Wisconsin has the most rural residents, 173,000, who are covered only by air service, although this accounts for only 7.6

¹¹ Long distance trips are defined as a trip of 50 miles or more away from home. The National Household Travel Survey highlights report can be found at http://www.bts.gov/publications/national_household_travel_survey or ordered at www.bts.gov/pdc/index.xml. Trips by mode can be found on table A-22 of the report.

TABLE 6

States with Greatest and Least Intercity Rail Coverage**Highest percent rural rail coverage by state**

	Rural population	Coverage	Percent covered
Rhode Island	175,457	175,457	100.0%
Connecticut	595,174	546,415	91.8%
Vermont	448,107	374,547	83.6%
Massachusetts	887,715	707,520	79.7%
California	3,835,613	2,712,538	70.7%
Washington	1,548,161	1,084,847	70.1%
Florida	3,618,587	2,444,573	67.6%
South Carolina	2,035,045	1,366,068	67.1%
Illinois	2,301,905	1,503,465	65.3%
New York	3,541,133	2,221,972	62.7%

Lowest percent rural rail coverage by state

	Rural population	Coverage	Percent covered
Wyoming	259,459	0	0.0%
Hawaii	363,545	0	0.0%
South Dakota	481,959	0	0.0%
Tennessee	2,583,439	162,679	6.3%
Idaho	624,767	45,378	7.3%
Kentucky	2,191,907	208,680	9.5%
Iowa	1,548,051	205,181	13.3%
Montana	506,692	88,044	17.4%
Delaware	275,710	56,423	20.5%
Oklahoma	1,575,634	327,559	20.8%

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

percent of the state's rural population. The number of rural residents for whom air service is the sole intercity access can be found, by state, in table 11.

Rail Service

Amtrak and the Alaska Railroad are the two providers of intercity (noncommuter) rail service in the United States. There are 34.6 million rural residents living within the coverage areas of these two carriers.¹² Amtrak's trains serve 520 locations, and the Alaska Railroad serves another 20 locations.¹³ In addition to Alaska, there are 6 states that have 20 or more intercity rail stations. California with 67 stations and Illinois with 30 have the most intercity rail service locations. There are three states whose residents are not served by intercity rail—South Dakota, Wyoming, and Hawaii.

Rhode Island is the only state where all rural residents live within the 25-mile radius around the intercity rail stations. There are two other states where at least 80 per-

¹² 34.7 million rural residents live within the Amtrak service area and 125,000 are within 25 miles of the Alaska Railroad stations.

¹³ Certain Alaska Railroad trains will pick up and discharge passengers who "flag" the train anywhere along the track. For the purposes of this study, only scheduled stops at stations in places with postal zip codes are included.

cent of the rural population is within the rail service area, three more where rail covers at least 70 percent, five states with at least 60 percent, and three more with at least 50 percent coverage by rail.

Table 6 shows the states with the highest and lowest percentage of rural residents covered by intercity rail service.

Intercity rail provides the sole intercity passenger transportation access to 349,000 rural residents in the 48 mainland states. The elimination of more than 100 intercity bus locations on April 3, 2005 increased the number of rural residents served solely by rail by about 29,000. Georgia with 61,000 and South Carolina with 33,000 have the most residents served only by rail. These two states account for 27 percent of the rural residents for whom rail is the only accessible mode. However, Montana and Nebraska have the highest percentage of rural residents with access only to rail, at 3.3 percent and 2.4 percent of the rural populations, respectively. The number of rural residents for whom rail is the sole intercity access can be found, by state, in table 11.

RURAL TRANSPORTATION BY STATE AND REGION

In addition to looking at each mode's role, BTS also looked at the overall availability of rural intercity transportation on a state and regional basis. The regional analysis looks at Alaska and Hawaii separately from the remainder of the Census Bureau Pacific Division (Washington, Oregon, and California) because the transportation environment in those two states is unique compared to the mainland states. Also, BTS examines the area commonly referred to as the Northeast corridor (NEC) separately because the Census Bureau splits this important transportation corridor among three divisions.¹⁴

Intercity transportation coverage is most comprehensive in the East and along the west coast. In these areas, the combination of bus, rail, and air service reaches most rural residents. By contrast, in the less heavily populated West North Central and Mountain states a greater percentage of rural residents find themselves beyond the coverage areas of intercity transportation. These two areas are the only ones where less than 90 percent of rural residents are within the coverage areas of any of the modes. Table 7 details the percentage of the rural population with commercial intercity transportation coverage in each area of the country, while table 8 ranks the states by highest and lowest percentage of rural residents with coverage.

While intercity bus is the most widely available mode, followed by airline service and then intercity rail service, the relative importance of each of these modes in providing rural intercity transportation mobility varies geographically. Also, mobility varies for rural residents depending on how many modes offer coverage in their area. Although 94 percent of the 82.4 million rural residents (76.5 million residents)

¹⁴ For purposes of this analysis, the Northeast Corridor is considered to include the states of Connecticut, Delaware, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, and Rhode Island.

TABLE 7

Rural Access to Commercial Intercity Transportation by Census Division

Percent of rural population within the coverage of each area

Census Bureau division (except as noted)	States included	Rural population	Rail	Air	Bus	Intercity ferry	Any mode	One mode only	All three modes
New England	CT/ME/MA/NH/RI/VT	3,611,665	65.8%	81.4%	91.9%	0.0%	94.2%	10.1%	61.0%
North Atlantic	NJ/NY/PA	7,942,997	53.8%	84.1%	97.8%	0.0%	99.5%	10.9%	47.7%
South Atlantic	DE/FL/GA/MD/NC/SC/VA/WV	17,719,984	50.5%	75.3%	93.1%	0.0%	96.2%	17.2%	43.6%
Northeast Corridor	CT/DE/MA/MD/NJ/NY/PA/RI	10,956,473	58.7%	87.5%	97.4%	0.0%	99.6%	9.3%	53.8%
East North Central	IL/IN/MI/OH/WI	13,430,581	45.6%	77.1%	89.6%	0.0%	95.4%	14.1%	36.6%
West North Central	IA/KS/MN/MO/NB/ND/SD	8,189,424	25.3%	52.7%	75.2%	0.0%	81.3%	30.9%	18.0%
East South Central	AL/KY/MS/TN	8,989,199	19.8%	52.8%	87.9%	0.0%	91.0%	32.8%	11.4%
West South Central	AR/LA/OK/TX	10,386,799	31.8%	63.2%	88.9%	0.0%	91.1%	24.7%	26.4%
Mountain	AZ/CO/ID/MT/NV/NM/UT/WY	4,962,904	25.0%	63.4%	77.5%	0.0%	84.7%	22.2%	18.8%
Pacific (mainland)	CA/OR/WA	6,477,035	66.6%	82.7%	92.7%	0.5%	95.5%	12.6%	63.1%
	Alaska	305,546	41.1%	87.9%	N/A	15.4%	91.3%	27.4%	N/A
	Hawaii	363,545	N/A	97.6%	N/A	0.0%	97.6%	97.6%	N/A

NOTE: For this analysis BTS has considered Alaska and Hawaii separately from the Mainland portion of the Census Bureau Pacific Division. The Northeast Corridor Division is not a Census Bureau division, but was created for this study due to the importance of these states as a single transportation corridor. The Northeast Corridor overlaps portions of the New England and South Atlantic Divisions and all of the North Atlantic Division.

NOTE: Although Alaska and Washington State are served by four modes, a four-mode figure is not deemed to be a relevant access measure due to the geographically limited nature of intercity ferry services.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics' Jan. 15, 2003 analysis of the U.S. rail, air, and bus network, as updated Aug. 18, 2004.

are in the coverage area of at least one commercial mode, only 36 percent (29 million residents) have a choice of all three modes.¹⁵ The heavily populated Northeast and the west coast have the highest percentage of rural residents with access to all three modes. This results in a higher level of mobility than that enjoyed by rural residents in the south and central parts of the country who are more likely to be served by only a single intercity transportation mode.

Table 9 ranks the states by highest and lowest percentage of rural residents with access to all three modes of intercity transportation.

Table 10 shows the states where 25 percent or more of the rural residents have access to only a single mode of scheduled intercity transportation.

Table 11 shows for all states the number of rural residents, the number covered by each mode, and the number relying on each of the modes as their only access to scheduled intercity transportation.

¹⁵ In the mainland states, air, bus, and rail are the three main modes. Bellingham, Washington, is the only mainland location served by intercity ferry.

TABLE 8

Rural Population Coverage by Commerical Intercity Transportation**States with highest coverage (99 percent or better)**

	Rural population	Coverage	Percent covered
Massachusetts	887,715	887,715	100.0%
New Jersey	846,452	846,452	100.0%
Connecticut	595,174	595,174	100.0%
Delaware	275,710	275,710	100.0%
Rhode Island	175,457	175,457	100.0%
South Carolina	2,035,045	2,031,736	99.8%
Vermont	448,107	447,029	99.8%
Indiana	2,367,966	2,362,144	99.8%
Maryland	1,079,420	1,075,286	99.6%
Pennsylvania	3,555,412	3,540,178	99.6%
Florida	3,618,587	3,599,482	99.5%
New York	3,541,133	3,513,965	99.2%
Ohio	3,341,447	3,314,610	99.2%

States with least coverage (85 percent coverage or less)

	Rural population	Coverage	Percent covered
North Dakota	343,379	201,980	58.8%
South Dakota	481,959	299,158	62.1%
Nebraska	685,274	456,511	66.6%
Montana	506,692	388,190	76.6%
Wyoming	259,459	201,050	77.5%
Kansas	1,066,777	836,692	78.4%
Arkansas	1,645,360	1,296,772	78.8%
Kentucky	2,191,907	1,727,899	78.8%
Iowa	1,548,051	1,228,783	79.4%
West Virginia	1,183,772	955,127	80.7%
Oklahoma	1,575,634	1,274,707	80.9%
Arizona	1,022,470	836,087	81.8%
Utah	513,571	422,295	82.2%
Idaho	624,767	526,082	84.2%

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

SERVICE LEVELS AND CONNECTIVITY

This study does not specifically address the service levels provided at each of the intercity transportation facilities. BTS included any facility that has year-round scheduled service. In a few cases, service is provided on a less-than-daily basis, such as Amtrak routes with triweekly service or the Alaska Railroad, which runs less than daily service during the winter months. In addition, the facilities range from large hub airports with an array of ancillary services down to intercity bus loading points that are simply a designated location along a highway. The criterion for being included as an intercity transportation facility is that the location is one where an intercity service carrier makes regularly scheduled stops throughout the year to pick up and discharge intercity passengers.

Connectivity, or intermodalism, is an important factor in determining how well the intercity transportation network serves the transportation needs of rural areas. The

TABLE 9

**States with the Greatest and Least Residents with Three-Mode Access
Among States Served by All Three Modes**

States with highest percent of three-mode access

	Rural population	All mode access	Percent covered
Rhode Island	175,457	174,555	99.5%
Connecticut	595,174	546,415	91.8%
Massachusetts	887,715	707,520	79.7%
California	3,835,613	2,601,013	67.8%
Washington	1,548,161	1,024,342	66.2%
Florida	3,618,587	2,230,528	61.6%
Vermont	448,107	272,384	60.8%
Maryland	1,079,420	616,945	57.2%
New York	3,541,133	1,861,384	52.6%
Illinois	2,301,905	1,138,922	49.5%
North Carolina	4,046,391	1,945,518	48.1%

States with lowest percent of three-mode access

	Rural population	Coverage	Percent covered
Idaho	624,767	4,012	0.6%
Tennessee	2,583,439	77,309	3.0%
Iowa	1,548,051	74,698	4.8%
Kentucky	2,191,907	128,774	5.9%
Montana	506,692	38,370	7.6%
Oklahoma	1,575,634	181,696	11.5%
Alabama	2,431,865	374,685	15.4%
Georgia	3,121,275	500,689	16.0%
New Mexico	698,221	133,911	19.2%
Arkansas	1,645,360	322,495	19.6%

NOTE: Hawaii, South Dakota, and Wyoming do not have service from three intercity modes and thus are not listed. Although Alaska and Washington State are served by four modes, only three-mode access is considered relevant due to the limited geographic nature of ferry service.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

ability to access the services of one mode and conveniently transfer to another mode extends the reach of all the modes. For example, although some rural areas may be in the coverage area of only intercity bus, if the intercity bus provides service to a hub airport and an Amtrak station, rural residents in that area may effectively have access to all three modes even though they reside in the service area of only one mode. BTS plans to examine the degree and availability of intermodal connections in future work.

METHODOLOGY NOTES

The Rural Intercity Transportation study employed a four-step GIS analysis:

1. identify the areas and population comprising "Rural America;"
2. develop a database of all intercity air, rail, bus, and ferry terminals, and map those facilities;

TABLE 10

States With the Highest Rural Population Percentage with Single Mode Coverage

	Rural population	Single mode coverage	Percent
Hawaii	363,545	354,950	97.6%
Alabama	2,431,865	1,026,192	42.2%
Oklahoma	1,575,634	643,906	40.9%
Idaho	624,767	215,540	34.5%
Iowa	1,548,051	530,621	34.3%
Wyoming	259,459	85,644	33.0%
Georgia	3,121,275	987,927	31.7%
Tennessee	2,583,439	795,380	30.8%
Kentucky	2,191,907	655,944	29.9%
Nebraska	685,274	204,216	29.8%
Arkansas	1,645,360	488,429	29.7%
Alaska	305,546	83,805	27.4%
Montana	506,692	137,563	27.1%
New Mexico	698,221	187,224	26.8%
Mississippi	1,780,759	469,018	26.3%
Minnesota	1,832,312	482,581	26.3%
Missouri	2,231,672	579,233	26.0%
Kansas	1,066,777	271,296	25.4%

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

3. draw a service coverage area radius around each terminal; and
4. determine the total population served by identifying those rural points falling within the reasonable access radius of any of the intercity terminals.

Definition of Rural America

BTS considered as rural any area in the United States that the Census Bureau did not identify as either an “urbanized area” or an “urban cluster.” Urbanized areas are towns, cities, or other places, or more than one contiguous place, with a population of 50,000 or more. Urbanized areas are generally, but not always, located around larger cities. Urban clusters, a new census category added in 2000, are places of 2,500 to 50,000 population that lie outside urbanized areas. Urban clusters account for about 30 million people. These cities, towns, or adjacent communities have the density to be considered urban in character. However, they are often located far from major metropolitan areas and are in the part of the country that many people would consider “rural America.”

After careful study we decided that consistency required us to consider urban clusters as urban, regardless of their location. In this way the BTS methodology for determining rural populations will be consistent with those used by other Federal entities when discussing rural America. Also, to determine which urban clusters are rural in nature and which are not would have added a significantly complex layer to the analysis in an area outside of BTS expertise.

TABLE 11
Scheduled Intercity Transportation and the U.S. Rural Population

State Name	Total rural residents	All modes	Intercity rail service		Air service		Intercity bus service	
		Residents in the service area of at least one mode	Residents in service area	Residents in rail service area ONLY (not in air, bus or ferry areas)	Residents in service area	Residents in air service area ONLY (not in rail, bus or ferry areas)	Residents in service area	Residents in bus service area ONLY (not in rail, air or ferry areas)
Alabama	2,431,865	2,281,505	646,632	0	1,013,704	30,338	2,258,196	995,854
Alaska	305,546	279,065	125,458	0	268,638	78,777	0	3,151
Arizona	1,022,470	836,087	311,237	0	647,220	62,424	774,254	130,499
Arkansas	1,645,360	1,296,772	398,922	18,537	814,421	63,968	1,531,640	405,924
California	3,835,613	3,718,304	2,712,538	7,603	3,309,342	69,769	3,667,913	306,134
Colorado	995,034	902,883	279,711	2,911	759,586	67,067	825,444	97,994
Connecticut	595,174	595,174	546,415	0	595,174	0	595,174	0
Delaware	275,710	275,710	56,423	0	236,952	0	275,710	38,758
Florida	3,618,587	3,599,482	2,444,573	0	3,269,172	21,365	3,556,355	138,407
Georgia	3,121,275	3,037,875	656,827	61,326	2,050,479	93,886	2,878,338	832,715
Hawaii	363,545	354,950	0	0	354,950	354,950	0	0
Idaho	624,767	526,082	45,378	8,972	296,975	18,827	499,798	187,741
Illinois	2,301,905	2,160,333	1,503,465	9,578	1,724,992	82,045	2,030,994	124,283
Indiana	2,367,966	2,362,144	1,023,242	0	1,973,165	92,260	2,264,057	213,175
Iowa	1,548,051	1,228,783	205,181	17,476	630,575	45,420	1,166,380	467,725
Kansas	1,066,777	836,692	339,161	19,588	576,414	59,192	804,784	192,516
Kentucky	2,191,907	1,727,899	208,680	0	1,164,629	141,020	1,544,441	514,924
Louisiana	1,738,397	1,618,770	706,117	0	1,009,080	36,491	1,678,535	396,785
Maine	885,540	757,942	231,727	13,412	575,168	40,641	683,780	164,821
Maryland	1,079,420	1,075,286	673,172	0	1,013,229	91,387	968,695	18,946
Massachusetts	887,715	887,715	707,520	0	887,715	3,284	884,431	0
Michigan	3,134,746	3,022,476	1,751,639	24,477	2,216,557	62,626	2,828,632	603,366
Minnesota	1,832,312	1,655,356	509,546	7,199	1,159,345	70,428	1,570,932	404,954
Mississippi	1,780,759	1,693,321	765,828	2,027	913,364	11,279	1,680,556	455,712
Missouri	2,231,672	1,977,241	733,333	23,785	1,344,171	61,357	1,956,313	494,091
Montana	506,692	388,190	88,044	16,748	253,827	14,346	333,314	106,469
Nebraska	685,274	456,511	188,652	16,478	272,060	35,391	404,462	152,347
Nevada	342,690	312,831	122,075	0	286,771	19,956	295,406	15,297
New Hampshire	619,672	537,726	342,343	9,871	414,014	0	525,465	82,330
New Jersey	846,452	846,452	420,326	0	846,452	36,352	801,768	0
New Mexico	698,221	611,907	200,925	0	402,519	43,579	575,589	143,645
New York	3,541,133	3,513,965	2,221,972	4,692	2,796,708	58,497	3,445,631	372,807
North Carolina	4,046,391	3,894,425	2,014,474	0	3,209,555	58,835	3,843,039	602,767
North Dakota	343,379	201,980	95,063	6,654	131,270	8,286	169,161	54,484
Ohio	3,341,447	3,314,610	1,115,880	0	2,969,838	75,780	3,183,651	236,796
Oklahoma	1,575,634	1,274,707	327,559	1,899	547,785	60,948	1,361,376	581,059
Oregon	1,093,261	1,048,956	515,154	4,155	754,479	9,427	1,014,317	247,977
Pennsylvania	3,555,412	3,540,178	1,631,674	0	3,039,187	10,487	3,527,402	383,763
Rhode Island	175,457	175,457	175,457	0	175,457	0	174,555	0
South Carolina	2,035,045	2,031,736	1,366,068	33,381	1,247,319	28,617	1,974,745	324,982
South Dakota	481,959	299,158	0	0	200,815	10,285	288,663	98,343
Tennessee	2,583,439	2,475,050	162,679	0	1,657,591	63,291	2,415,894	732,089
Texas	5,427,408	5,271,684	1,865,324	8,987	4,196,749	19,139	5,264,743	974,125
Utah	513,571	422,295	193,764	4	363,195	36,945	402,765	44,309
Vermont	448,107	447,029	374,547	0	293,418	0	447,029	51,448
Virginia	2,359,784	2,185,717	1,236,175	4,326	1,501,125	55,752	2,121,458	505,601
Washington	1,548,161	1,417,724	1,084,847	1,480	1,293,751	66,352	1,322,217	104,462
West Virginia	1,183,772	955,127	502,018	19,838	817,707	27,433	897,225	88,386
Wisconsin	2,284,517	1,953,797	735,164	3,554	1,471,913	172,745	1,746,303	330,077
Wyoming	259,459	201,050	0	0	134,619	19,213	181,837	66,431
Totals	82,378,450	76,486,109	34,562,909	348,958	58,083,141	2,590,457	73,643,367	13,488,469

BTS analysis based on scheduled services provided on Apr. 3, 2005.

NOTE: In Alaska there are 47,155 rural residents with access to the Interstate ferry service offered by the Alaska Marine Highway System, and for 1,877 rural residents the ferry provides their only intercity transportation access. In Washington State there are 35,561 rural residents with access to the Alaska Marine Highway, with all having access to at least one other mode.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' April 2005 analysis of the U.S. scheduled intercity transportation network.

Intercity Passenger Facility Database Development

Information on the location of intercity transportation terminals, including geographic coordinates, came from several sources as follows:

- BTS' geospatial database of Amtrak Stations. Based on the year 2000 Amtrak system, this database was updated to add all current stations shown in Amtrak's fall/winter 2004-2005 Northeast and National Timetables.
- The March 1, 2005 North American Edition, Official Airline Guide (OAG Worldwide, Downer's Grove, IL) was used to select the active airline airports from the BTS geospatial database of all airports with FAA reported enplanements.
- Intercity bus terminal data was obtained from an electronic database provided to BTS by Greyhound Lines of all the intercity bus stations in its TRIPS ticketing system database.
 - Russell's North American Motorcoach Guide, February 2005 edition, was used to validate locations in the Greyhound database and to add locations not included by Greyhound.
 - Locations discontinued by Greyhound through April 3, 2005 at which no other carrier provides intercity bus service were removed from the database.
- Alaska Marine Highway System service locations were obtained from the company's website at www.ferryalaska.com. Geographic coordinates for ferry service locations were obtained from the National Ferry Database, U.S. Department of Transportation, Federal Highway Administration, December 2000, at www.transtats.bts.gov.
- Bureau of the Census, 2000 population data.
- Bureau of the Census, 2002 definitions of urbanized areas and urban clusters.

Service Coverage Areas

For this analysis, BTS used a 25-mile radius to reflect a reasonable coverage area around a bus or rail station or a small or nonhub airport.¹⁶ For medium and large hub airports the study used a wider 75-mile coverage radius. These parameters are based on commonly used assumptions within the industry and previous work done by BTS and the Office of the Secretary of Transportation.¹⁷ They are consistent with criteria used to determine eligibility for subsidized air service under the Essential Air Service (EAS) program. For the purposes of this analysis, there was no adjustment made to coverage areas to account for natural boundaries to access such as lakes, mountains, bays, etc., with the exception of Hawaii. In Hawaii, the coverage area for each airport was confined to the island on which that airport was located.

¹⁶ A large hub is one that annually enplanes at least 1 percent of all domestic enplanements, medium hubs enplane 0.25 to 0.999 percent of domestic enplanements, small hubs 0.05 to 0.249 percent, and nonhub airports less than 0.05 percent of domestic enplanements.

¹⁷ B.D. Spear and R.W. Weil, "Access to Intercity Transportation Services from Small Communities: A Geospatial Analysis," Transportation Research Record 1666 (Washington, DC: Transportation Research Board, 1999).

Population Data

The following steps were taken to identify and quantify the rural population within the coverage area of each of the modes:

- Identified rural population from the latest available census data (2000) at the time the analysis was conducted.
- Used census block group data to determine population.
- Identified Amtrak, Alaska Railroad, and Intercity Bus Stations as well as Airline Airports.
- Mapped stations using geographic coordinates when available or via the place name or zip code when geographic coordinates could not be obtained.
- Drew reasonable access radius (25 or 75 miles as discussed above) around facility.
- Population for block groups identified as rural falling within the reasonable access radius determines the total rural population with access to that mode of transportation.

