The UNIVERSITY of VERMONT

James M. Jeffords Center's
Vermont Legislative Research Service

Benefits and Costs of Passenger Rail Transportation

In this report we discuss the estimated safety, environmental, energy, and economic benefits of state subsidies for passenger rail, the current state of the passenger rail system in Vermont, and the passenger rail systems in the states of California, Illinois, and Iowa. Additionally, we compare state spending on highway infrastructure in relation to what the state spent on the infrastructure of its passenger rail system in FY 2011.

Benefit of Subsidizing Passenger Rail: Safety

According to a report prepared by the Passenger Rail Working Group (PRWG) [1] in December of 2007, "expansion of intercity passenger rail can provide a safer travel option for those who choose trains over autos."[2] As demonstrated in the table below, passenger rails have a much lower death rate than automobiles. In funding passenger rail, states are supporting a safer transportation mode.

Table 1: Safety of Various Transportation Modes

Mode of Transportation	Death Rate per 100 Million Passenger Miles
Automobile	0.80 deaths
Intercity Bus	0.05 deaths
Passenger Rail	0.03 deaths
U.S. Air Travel	0.02 deaths

Source: The Passenger Rail Working Group, "U.S. Intercity Passenger Rail Network Through 2050," p. 9.

[1] PRWG is a group formed to advise the National Surface Transportation Policy and Revenue Study Commission, a bipartisan organization formed last year with 12 members appointed by the president and Congressional leaders.
[2] The Passenger Rail Working Group, "U.S. Intercity Passenger Rail Network Through 2050," last modified December 6, 2007, accessed February 27, 2012, http://www.dot.state.wi.us/projects/state/docs/prwg-report.pdf, p. 8.

Benefit of Subsidizing Passenger Rail: Energy and the Environment

In 2009, data from the Transportation Energy Data Book indicates that automobiles use an average of 3,538 British thermal units (BTU) per passenger-mile, and rail, encompassing intercity Amtrak, rail transit, and commuter rail, uses between 2,435 and 2,812 BTU per passenger-mile.[3] While the report notes, "great care should be taken when comparing mode of transportation" and that "it is not possible to obtain truly comparable national energy intensities among modes," data from the International Energy Agency indicates that passenger rail is a more energy efficient mode of transportation than automobiles.[4] Investing in passenger rail is investing in a mode of transportation that produces lower greenhouse gas emissions, which have both human health and environmental impacts.[5]

When examining the environmental benefits of passenger rail, it is worth noting the environmental awareness of the company providing the rail service. Amtrak itself has made environmental benefits a focus of their passenger rail service. Amtrak is active in two organizations that help companies assess the contributions they make toward greenhouse gas emissions and consumption of natural resources: Climate Counts and the Climate Registry.[6] Climate Counts gives each registered company a grade based on four major categories that are intended to address corporate climate responsibility:

1. measurement of climate impact;
2. reduction of climate impact;
3. support for public policy that will reduce greenhouse gas emissions; and
4. external transparency and clarity on climate actions.

Amtrak scored 71 out of 100 in 2011, a nine-point increase from 2010, and is ranked in the top tier of all companies ranked by Climate Counts.[7] The organization made the following statement regarding Amtrak:

> Amtrak is making significant progress in reducing fuel use through anti-idling practices for locomotives, installation of automatic start/stop technology that also limits idling of locomotives, aerodynamic improvements of rolling stock that reduce "drag," improved engineer training for more fuel-efficient locomotive

[3] US Department of Energy, "Transportation Energy Data Book: Edition 30," last modified June 2011, accessed February 27, 2012, http://cta.ornl.gov/data/download30.shtml, Chapter 2 p. 2-13, 2-14.
[4] International Energy Agency, "Transport, Energy and CO_2," last modified 2009, accessed February 2, 2012, http://www.iea.org/textbase/nppdf/free/2009/transport2009.pdf.
[5] The Passenger Rail Working Group, "U.S. Intercity Passenger Rail Network Through 2050," p. 13.
[6] The National Railway Passenger Corporation, "Amtrak Annual Report FY 2010," last modified December 16, 2010, accessed February 1, 2012, http://procurement.amtrak.com/wps/wcm/connect/17a8100047ed4d6b9b1afffa2cf878f3/Amtrak_AmtrakAnnualReport_2010_v1.pdf?MOD=AJPERES&CACHEID=17a8100047ed4d6b9b1afffa2cf878f3, p. 29.
[7] ClimateCounts.org, "Climate Counts 5th Annual Company Scorecard 2011," last modified December 2011, accessed February 1, 2012, http://climatecounts.org/pdf/CC_2011_FinalScores.pdf, p. 14.

operations, and emerging green technology.[8]

Benefit of Passenger Rail: Consumer Demand

Currently two intercity passenger rail lines operate in the state of Vermont: the Vermonter and the Ethan Allen Express. Amtrak, a government run corporation, operates both of these lines. The Vermonter line begins in St. Albans, Vermont and includes stops in New York, Philadelphia, Baltimore, and Washington D.C. The Vermonter makes a total of 30 stops. The Ethan Allen Express is a shorter route that begins in Rutland, VT and ends in New York City's Penn Station. This rail line makes two stops in Vermont and ten stops in New York.[9]

Amtrak breaks down their passenger rail lines into three business categories: Northeast Corridor Lines, State-Supported/Short Distance Lines, and National/Long Distance Lines. The Vermonter and the Ethan Allen Express both fall under the State-Supported/Short Distance category. As demonstrated in Figure 1 and Figure 2, ridership and ticket revenues in the State-Supported/Short Distance category have steadily increased over the past 11 years. In 2000, Amtrak recorded $228,463,876 in ticket revenue and serviced 8,577,490 people. By 2011, the annual revenue numbers increased to $426,965,070 and 14,765,011 people respectively.[10]

From 2009-2011, the Ethan Allen Express recorded a 5.8% increase in ridership and a 6.7% increase in ticket revenue. Between 2009 and 2010, the Vermonter recorded a 16.5% increase in ridership and a 19.1% increase in ticket revenue.[11] As a result of track outages and severe flooding damages due to Hurricane Irene, the Vermonter used bus substitution for three months and did not see the same increases in 2011.[12] Despite the three-month suspension of service, ridership totals in 2011 were still higher than those same figures in 2009, by 3,767 people.[13] Table 2 demonstrates trends in ticket revenue and ridership from 2009-2011 for the Ethan Allen Express, the Vermonter, and the National Amtrak State-Supported/Short-Distance Business category.

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[8] ClimateCounts.org, "Company Scorecard: Amtrak," last modified 2011, accessed February 1, 2012, http://climatecounts.org/scorecard_score.php?co=164.

[9] National Railroad Passenger Corporation, "Vermonter/Ethan Allen Route Guides," p. 3.

[10] National Railroad Passenger Corporation, "Amtrak Ridership Rolls Up Best-ever Records," last modified October 13, 2011, accessed January 30, 2012, http://www.amtrak.com/servlet/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1249232964000&blobheader=application/pdf&blobheadername1=Content-disposition&blobheadervalue1=attachment;filename=Amtrak_ATK-11-133_Record_FY11_Ride p. 5.

[11] National Railroad Passenger Corporation, "Amtrak sets new ridership record, thanks passengers for taking the train: strong performance shows demand for passenger rail continues to grow," last modified October 11, 2010, accessed February 1, 2012, http://www.amtrak.com/servlet/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1249216336898&blobheader=application/pdf&blobheadername1=Content-disposition&blobheadervalue1=attachment;filename=Amtrak_ATK-10-134_AmtrakRidershipRecordFYh p. 3.

[12] The National Railroad Passenger Corporation, "Amtrak Fact Sheet, Fiscal Year 2011: State of Vermont," last modified Summer 2011, accessed February 6, 2012, http://www.amtrak.com/pdf/factsheets/VERMONT11.pdf, p. 2.

[13] Calculated using information taken from documents found in footnote 6 & 9.

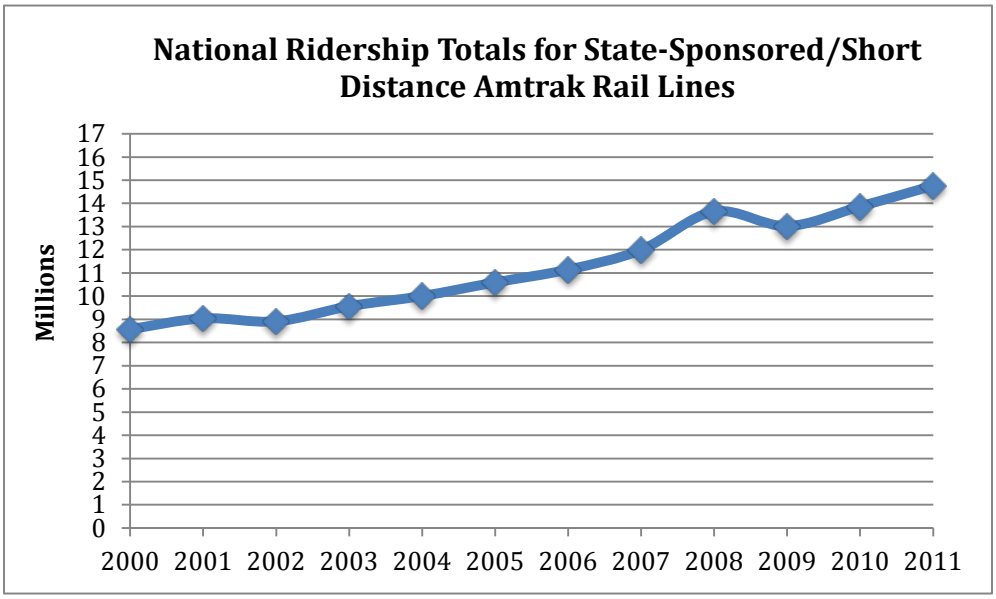

Figure 1: Amtrak Ridership Trends between 2000-2011.[14]

Source: National Railroad Passenger Corporation, "Amtrak Ridership Rolls Up Best-ever Records," p. 5.

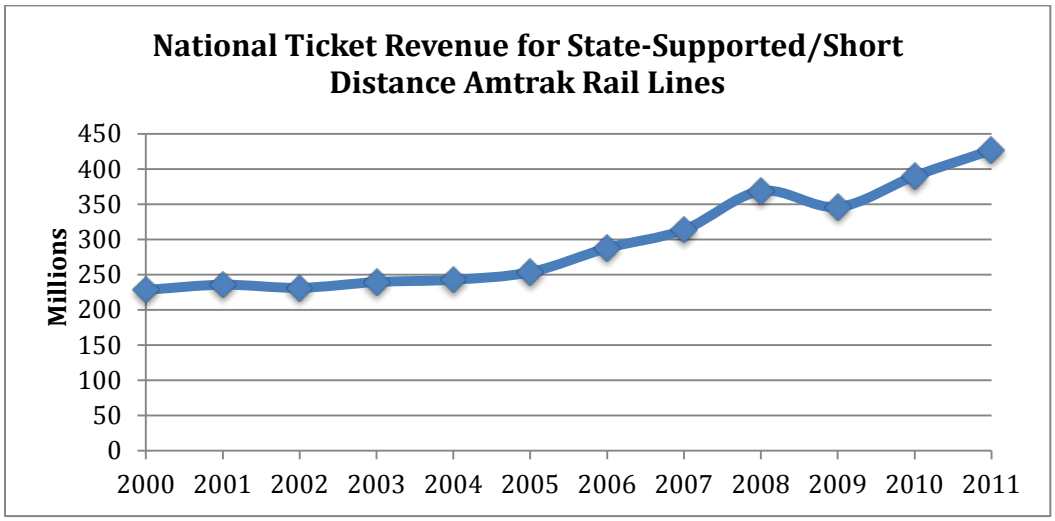

Figure 2: Amtrak Ticket Revenue Trends Between 2000-2011.[15]

Source: National Railroad Passenger Corporation, "Amtrak Ridership Rolls Up Best-ever Records," p. 5.

[14] National Railroad Passenger Corporation, "Amtrak ridership rolls up best-ever records," p. 5.
[15] National Railroad Passenger Corporation, "Amtrak ridership rolls up best-ever records," p. 5.

Table 2: Ticket Revenue and Ridership Figures Between 2009-2011

	2009	2010	2011
Vermonter			
Ticket Revenue	$4,011,930	$4,778,747	$3,961,115
Ridership	74,016	86,245	77,783
Ethan Allen Express			
Ticket Revenue	$2,347,362	$2,398,998	$2,504,308
Ridership	46,748	48,031	49,448
All State-Supported/Short Distance			
Ticket Revenue	$346,230,996	$390,017,549	$426,965,070
Ridership	13,022,237	13,866,804	14,765,011

Sources: National Railroad Passenger Corporation, "Amtrak ridership rolls up best ever," p. 5. National Railroad Passenger Corporation, "Amtrak ridership rolls up best ever, thanks passengers for taking the train: Strong performance shows demand for passenger rail continues to grow," p. 5.

These trends suggest that the demand for passenger rail service in Vermont is increasing and state-supported/short distance passenger rail systems across the country are experiencing increases as well. Despite the Vermonter's three-month interruption in service due to Irene, trends suggest that growth in ridership and ticket revenue will resume in 2012. These statistics indicate that there is considerable demand for passenger rail services and this demand increases annually.[16]

Fiscal Concerns: Passenger Rail Subsidies and Transportation Spending

Vermont's Current Spending on Transportation

According to the Vermont Agency of Transportation (VTrans) Fiscal Year 2011 report,[17] transportation spending in Vermont totaled $547.0 million. Funding sources for total transportation expenditures consisted of 33% from VT state transportation funds ($178.3 million) and 45% from federal funds ($244.1 million). State transportation funds, federal funds, and funds from the American Recovery and Reinvestment Act, made up 90% of total funding sources in FY 2011.[18]

In 2011, Vermont spent $463.3 million of the total $547 million transportation budget on infrastructure and related costs (See Figure 3). Vermont's infrastructure related spending was primarily focused on roadways (32%), maintenance (15%), bridges (25%), and town highways

[16] National Railroad Passenger Corporation, "Amtrak Ridership Rolls Up Best-ever Records," p. 5.
[17] Vermont Department of Transportation, "VTrans Factbook," January 13, 2012, accessed February 1, 2012, http://www.aot.state.vt.us/planning/Documents/Planning/2012VTransFactbook.pdf, p. 22.
[18] Vermont Department of Transportation, "VTrans Factbook."

(8%). Spending toward supporting and maintaining automobile transportation infrastructure made up 80% of the $463.3 million infrastructure related spending (Figure 3). Meanwhile, railways in 2011 received 7% ($30.8 million) of the total amount spent on infrastructure in Vermont.

The train tracks are often used concurrently by Amtrak and private rail yards and train companies moving freight shipments throughout Vermont. This means passenger trains must compete with slow moving freights for use of limited track. Trains on the Ethan Allen and Vermonter lines have to adhere to a 20mph maximum speed on certain stretches of tracks and while crossing bridges along the routes that are in poor condition.[19] These railway infrastructure short comings contribute to considerable slowing of the passenger trains.[20]

Amtrak's Vermont lines received five million dollars from Vermont in FY 2011. This means in 2011 FY Vermont's passenger rails directly received approximately 16% of the 30.8 million spent by Vermont on railways.[21] Vermont railway support is increasing in FY 2012. According to the Vermont senate budget report in FY 2012, highway infrastructure will receive $335 million, while alternative modes are set to receive $100 million.[22] Of Vermont's alternative modes for FY 2012, rail infrastructure will receive $50 million and Amtrak is set to receive $4.5 million.[23]

Taken together, these figures indicate that state subsidies toward transportation infrastructure heavily favor highway over rail.

Subsidizing Passenger Rails

Vermont is not alone in subsidizing its passenger rail system. Half of the states in the country are currently active in supporting passenger rails.[24] Vermont is one of 15 states that directly subsidizes its passenger rail lines. The other states include: California, Illinois, Maine, Michigan, Missouri, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Texas, Virginia, Washington, and Wisconsin.[25]

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[19] Ledyard, King "Amtrak's troubles shifting passenger load to states," USA TODAY, P. 25A December 20, 2002, accessed February 1, 2012, http://www.usatoday.com/travel/news/2002/2002-12-20-amtrak-future.htm

[20] King, Ledyard, "Amtrak's troubles shifting passenger load to states"

[21] Vermont Legislative Joint Fiscal Office, "Senate Transportation FY12 Transportation Program," April 2011, accessed February 3, 2012, http://www.leg.state.vt.us/jfo/transportation.aspx.

[22] Vermont Legislative Joint Fiscal Office, "Senate Transportation FY12 Transportation Program."

[23] Vermont Legislative Joint Fiscal Office, "Senate Transportation FY12 Transportation Program."

[24] National Conference of State Legislatures, "High-Speed Rail Resources," last modified October 6, 2011, accessed February 2, 2012, http://www.ncsl.org/issues-research/transportation/high-speed-rail-resources.aspx.

[25] The National Railroad Passenger Corporation, "National Fact Sheet FY 2010," last modified February 2010, accessed February 3, 2012, http://www.amtrak.com/servlet/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1249224538317&blobheader=application/pdf&blobheadername1=Content-disposition&blobheadervalue1=attachment;filename=Amtrak_Amtrak_National_Fact_Sheet_FY_2010_Final_v3.pdf.

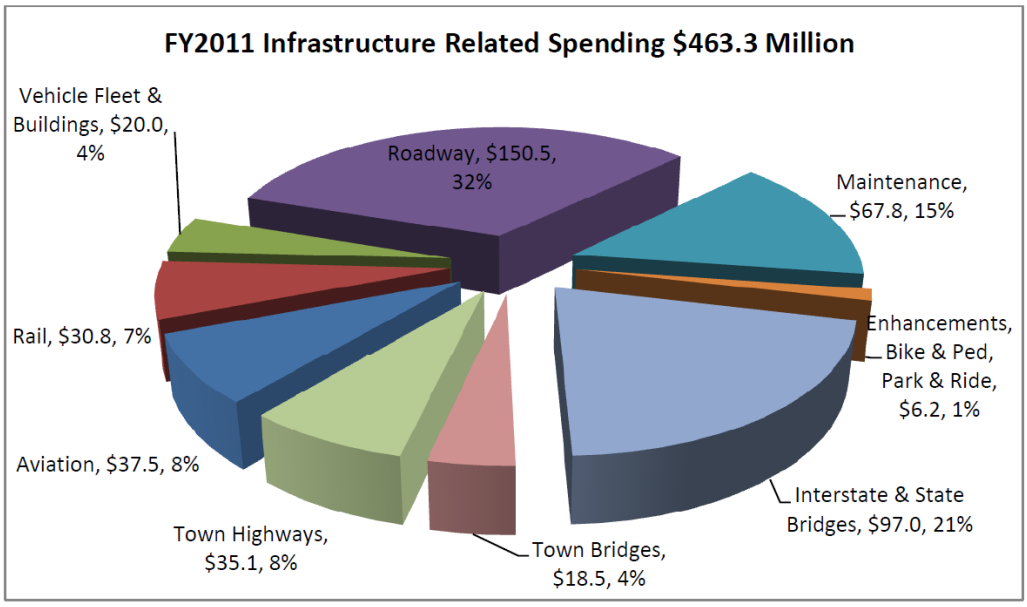

Figure 3: FY2011 Infrastructure Related Spending.[26]

Source: Vermont Department of Transportation, "VTrans Factbook."

Federal Subsidies

While Amtrak has experienced steady increases in ridership and ticket revenues for the past 11 years, the company is only a viable business operation with substantial federal subsidies. In Amtrak's *Consolidated Financial Report for FY 2011*, an Independent Auditors Report[27] confirms Amtrak's operational need for federal subsidies:

> The company has a history of operating losses and is dependent upon substantial federal government subsidies to sustain its operations…There are currently no federal government subsidies appropriated for any period subsequent to the fiscal year ending September 30, 2012.[28]

While continued Federal support is expected, Amtrak would not be able to continue to operate in its current form. Without federal subsidies, Amtrak in Vermont and throughout the nation would be subject to significant operating changes, restructuring, or even bankruptcy.[29]

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[26] Vermont Department of Transportation, "VTrans Factbook."
[27] The National Railway Passenger Corporation, "Consolidated Financial Statements FY 2011," last modified December 2011, accessed February 1, 2012, http://www.amtrak.com/servlet/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1249235953644&blobheader=application/pdf&blobheadername1=Content-disposition&blobheadervalue1=attachment;filename=Amtrak_Amtrak_Consolidated_Financial_Stath.
[28] The National Railway Passenger Corporation, "Consolidated Financial Statements FY 2011."
[29] The National Railway Passenger Corporation, "Consolidated Financial Statements FY 2011."

What Are Other States Doing?

California

California has seen increased levels of interest in the development of *high-speed* passenger rail connections from Los Angeles to the San Francisco Bay area and Sacramento in recent years. In 2008, California citizens voted in a statewide bond issue to provide $9.95 billion in funding for the construction of connecting cities with high-speed rail.[30] The federal government has followed suit with an additional $3.87 billion going directly to the California High-Speed Rail Authority (CHSRA),[31] a branch of the California Department of Transportation (Caltrans).[32] Although the total cost of the project has been the subject of recent debate in the state's government,[33] the CHSRA is continuing the planning stages and is currently set to begin construction in January 2013.[34]

Speculative reports on the project from the California High-Speed Rail Authority estimate several potential benefits for the people of California. These include: reducing traffic congestion on major freeways, creating nearly 160,000 jobs for construction of the railway system, and creating 450,000 jobs from the expected economic growth from the new railway.[35] Caltrans also estimates that the high-speed rail will reduce greenhouse gas emissions by over 12 billion pounds a year.[36] A life-cycle environmental impact study (which accounts for energy used in construction and use) by the University of California Transportation Center in 2010 confirms this claim, concluding that a new high-speed rail system in California can indeed reduce greenhouse gas emissions, although it would only do so over a long period of time dependent on mid- to high-level ridership.[37]

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[30] Christine Cosgrove, University of California Berkeley Institute of Transportation Studies, "Innovations: Research and News from Berkeley Engineering," last modified 2009, accessed February 2, 2012, http://innovations.coe.berkeley.edu/vol3-issue9-nov09/highspeedrail.

[31] Federal Railroad Administration, "FRA High-Speed Intercity Passenger Rail Funding Selection Summary," last modified 2011, accessed February 2, 2012, http://www.fra.dot.gov/rpd/downloads/Master_HSIPR_Selection_Sheet.pdf.

[32] California High-Speed Rail Authority, "California High-Speed Rail Authority," last modified 2012, accessed February 2, 2012, http://www.cahighspeedrail.ca.gov/.

[33] David Siders, "Jerry Brown Says Cap-and-Trade Fees Will Fund High-Speed Rail," *The Sacramento Bee*, January 29, 2012, accessed February 2,2012, http://blogs.sacbee.com/capitolalertlatest/2012/01/jerry-brown-says-cap-and-trade-fees-will-fund-high-speed-rail.html.

[34] California High-Speed Rail Authority, "Procurement and Procedure Policies," last modified 2011, accessed February 2, 2012, http://www.cahighspeedrail.ca.gov/CHSRTemplate_STDwoBanner.aspx?pageid=11253.

[35] California High-Speed Rail Authority, "High-Speed Trains for the Central Valley," last modified 2010, accessed February 2, 2012, http://www.cahighspeedrail.ca.gov/assets/0/152/159/6fddd231-7aa4-46ad-8d80-067b12189305.pdf.

[36] California High-Speed Rail Authority, "High-Speed Trains for the Central Valley."

[37] Chester, Mikhail, and Arpad Horvath, University of California Transportation Center, "Life-Cycle Environmental Assessment of California High-Speed Rail," last modified 2012, accessed February 2, 2012, http://www.uctc.net/access/37/access37_assessing_hsr.shtml.

Wisconsin-Illinois *Hiawatha* Service

Amtrak's *Hiawatha* line runs approximately 90 miles between Chicago, Illinois and Milwaukee, Wisconsin.[38] These two states jointly fund nearly 100% of the operating costs for seven daily trips provided by the service.[39] In 2011, Illinois and Wisconsin provided a total of $6.9 million to Amtrak to cover operating costs.[40] Ridership has been steadily increasing since 2002 and set new records in 2011.[41]

The success of the *Hiawatha* line can be attributed to its competitiveness with vehicle trips over the same distance, frequency of service, and state financial commitment to the program.[42] A study done by the Texas Transportation Institute in 2011 found that the railroad plays a major role in improving mobility and decreasing congestion on major highways in both of the cities serviced by the line, both the largest in their respective state.[43] The study found that 70% of train passengers would drive if the rail service were not available.[44]

Iowa

Iowa received $18 million from the federal government in 2010 as a part of the American Recovery and Reinvestment Act for Amtrak infrastructure improvement along existing rail lines in the southern part of the state.[45] The Iowa Department of Transportation expects the benefits of these funds to strengthen Iowa's economy by creating jobs and increasing connectivity across the state, which they hope will create business opportunities for Iowans in the realm of tourism and recreation. The state also cites the environmental benefits of passenger rail as reasons for development; intercity passenger rail uses approximately one-third less energy per passenger-mile than vehicles.[46]

Iowa is working with several other Midwestern states to develop passenger rail services that will connect the northern regions of America's heartland. The Midwest Regional Rail Initiative

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[38] Texas Transportation Institute, "Intercity Passenger Rail: Implications for Urban, Regional, and National Mobility," accessed March 1, 2012, http://www.highspeed-rail.org/Documents/TTI-UTCM-WisDOT-Project-Overview-1.pdf, p.1.

[39] Wisconsin Transportation Finance and Policy Commission, "Overview of the Rail Program," last modified October 25, 2011, accessed March 1, 2012, http://www.dot.state.wi.us/about/tfp/docs/mtg1-rail.pdf, p. 3.

[40] Wisconsin Transportation Finance and Policy Commission, "Overview of the Rail Program," p. 1.

[41] Wisconsin Transportation Finance and Policy Commission, "Overview of the Rail Program," p. 2.

[42] Texas Transportation Institute, "Intercity Passenger Rail: Implication for Urban, Regional, and National Mobility," p. 1.

[43] Texas Transportation Institute, "Intercity Passenger Rail: Implication for Urban, Regional, and National Mobility," p. 2.

[44] Texas Transportation Institute, "Intercity Passenger Rail: Implication for Urban, Regional, and National Mobility," p. 2.

[45] Grey-Fisher, Dena. Iowa Department of Transportation, "Iowa receives two high-speed passenger rail grants," last modified January 28, 2010, accessed February 3, 2012, http://www.news.iowadot.gov/newsandinfo/2010/01/iowa-receives-two-highspeed-passenger-rail-grants.html.

[46] Federal Railroad Administration, "A Vision of High-Speed Rail for America," last modified April 16, 2009, accessed March 1, 2012, http://www.fra.dot.gov/Downloads/RRdev/hsrspfacts.pdf.

advocates state funding of this project primarily on the basis that increased productivity of the Midwest economy will follow from advancing passenger rail plans in the region. They estimate that upon completion the net monetary benefits of their rail system will be $23.1 billion in additional economic activity for the states of Iowa, Illinois, Indiana, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin.[47] These benefits are measured in travel time reductions for passenger rail users as well as for users of other modes of transportation from reduced traffic congestion.[48]

Conclusion

For the last 11 years, passenger ridership on Vermont Amtrak lines has steadily increased. State spending in 2011 on general rail infrastructure is significantly lower (7%) than state spending on highway infrastructure (80%) and Amtrak received $5 million from the state of Vermont in direct subsidies in fiscal year 2011.[49] Existing literature indicates that state investment in passenger rail can have significant benefits in relation to mobility, safety, the environment, and economic development.

This report was completed on March 20, 2012 by Alison Kelly, Elizabeth Dunn, Marc Laliberte, and William Andreycak under the supervision of graduate student Kate Fournier and Professor Anthony Gierzynski in response to a request from the House Committee on Transportation.

Contact: Professor Anthony Gierzynski, 513 Old Mill, The University of Vermont, Burlington, VT 05405, phone 802-656-7973, email agierzyn@uvm.edu.

Disclaimer: This report has been compiled by undergraduate students at the University of Vermont under the supervision of Professor Anthony Gierzynski. The material contained in the report does not reflect the official policy of the University of Vermont.

[47] Transportation Economics & Management Systems, Inc., "Midwest Regional Rail Initiative Benefit Cost and Economic Analysis," last modified November 2006, accessed February 3, 2012, http://www.iowadot.gov/iowarail/passenger/mwrri-economic.pdf, p. 7.
[48] Transportation Economics & Management Systems, Inc., "Midwest Regional Rail Initiative Benefit Cost and Economic Analysis," last modified November 2006, accessed February 3, 2012, http://www.iowadot.gov/iowarail/passenger/mwrri-economic.pdf, p. 3.
[49] Vermont Legislative Joint Fiscal Office, "Senate Transportation FY12 Transportation Program."