RURAL CONNECTIONS: CHALLENGES AND OPPORTUNITIES IN AMERICA'S HEARTLAND

MAY 22, 2019

TRIP
a national transportation research group

WWW.TRIPNET.ORG

Founded in 1971, TRIP ® of Washington, DC, is a nonprofit organization that researches, evaluates and distributes economic and technical data on surface transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway and transit engineering and construction; labor unions; and organizations concerned with efficient and safe surface transportation.

Executive Summary

America's rural heartland plays a vital role as home to a significant share of the nation's population, many of its natural resources, and popular tourist destinations. It is also the primary source of the energy, food and fiber that supports America's economy and way of life. The strength of the nation's rural economy is heavily reliant on the quality of its transportation system, particularly the roads and highways that link rural America with the rest of the U.S. and to markets in other countries. The quality and connectivity of America's rural transportation system supports the economy of the entire nation and quality of life for the approximately 60 million Americans living in rural areas.

Good transportation is essential in rural areas to provide access to jobs, to facilitate the movement of goods and people, to access opportunities for health care and educational skills, and to provide links to other social services. Transportation supports businesses and is a critical factor in a company's decision to locate new business operations. For communities that rely on tourism and natural amenities to help support their economy, transportation is the key link between visitors and destinations.

Roads, highways, rails and bridges in the nation's heartland face a number of significant challenges: they lack adequate capacity; they fail to provide needed levels of connectivity to many communities; and, they cannot adequately support growing freight travel in many corridors. Rural roads and bridges have significant deficiencies and deterioration, they lack many desirable safety features, and they experience fatal traffic crashes at a rate far higher than all other roads and highways. This report looks at the condition, use and safety of the nation's rural transportation system, particularly its roads, highways and bridges, and identifies needed improvements.

Rural areas in this report are based on the U.S. Census Bureau definition, which defines rural areas as regions outside of urban areas with a population of 2,500 or more. Road, bridge and safety data in this report is based on the Federal Highway Administration (FHWA) definition for rural areas, which allows states to use the U.S. Census Bureau definition to identify rural routes or to define rural areas as regions outside of urban areas with a population of 5,000 or more. The following are the key findings of the report.

AMERICA'S RURAL HEARTLAND

Rural America is the primary source of the energy, food and fiber that drives the U.S. economy. The decline in rural population has been halted largely due to increasing employment and declining poverty.

- The U.S. Census Bureau defines rural areas as regions outside of urban areas with a population of 2,500 or more.

- According to the U.S. Census Bureau definition, 19 percent of the nation's residents live in rural areas – approximately 60 million people.

- The nation's rural areas account for 97 percent of America's land area and are home to the vast majority of the nation's 2.2 million farms.

- America's rural population, which had declined slightly from 2010 to 2016, increased in 2017, adding an additional 33,000 people. The modest rebound in rural population is likely a result of increased employment and declining poverty.

- The number of jobs in rural America increased by 370,000 from 2013 to 2017, and the rural unemployment rate has decreased steadily from 10.3 percent in 2010 to 4.4 percent in 2017.

- The rural poverty rate, which is the percentage of people making below the amount of money deemed necessary to have a basic standard of living, has decreased from 18.4 percent in 2013 to 16.4 percent in 2017.

- America's rural economy is far more reliant on goods production, which includes farming, forestry, fishing, mining and energy extraction, and manufacturing, than is the nation's urban economy.

- Many of the transportation challenges facing rural America are similar to those in urbanized areas. However, rural residents tend to be more heavily reliant on their limited transportation network - primarily rural roads and highways - than their counterparts in urban areas. Residents of rural areas often must travel longer distances to access education, employment, retail locations, social opportunities and health services.

- Nineteen percent of the rural population is 65 years or older, compared to 15 percent in urban areas.

- The movement of retiring baby boomers to rural America is likely to continue in the future as aging Americans seek out communities that offer affordable housing, small-town quality of life and desirable natural amenities, while often located within a short drive of larger metropolitan areas.

- The amount of rural tourism in a region is tied partly to the level of highway access. Eighty-six percent of trips taken by Americans to visit rural areas are for leisure purposes.

- Popular tourism activities in rural America include hiking, golfing, biking, hunting, fishing and water sports. Rural areas are also home to beaches, national and state parks, wineries, orchards and other national amenities.

RURAL QUALITY OF LIFE AND ECONOMIC VITALITY RELY ON TRANSPORTATION

The quality of life in America's small communities and rural areas, and the health of the nation's rural economy, is highly reliant on the quality of the nation's transportation system, particularly its roads, highways and bridges. America's rural transportation network provides the first and last link in the supply chain from farm to market while supporting the tourism industry and enabling the production of energy, food and fiber.

- Freight mobility and efficiency is fundamental to rural economic vitality and prosperity. Economic growth and stability in rural areas is heavily reliant on the ability to move raw materials into, or the value-added products out of, these areas.

- Agriculture, food, and related industries, including food and beverage manufacturing, apparel manufacturing and food and beverage stores and establishments -- which rely on agricultural inputs -- contributed $1.05 trillion to the U.S. gross domestic product (GDP) in 2016. This represents 5.7 percent of overall U.S. GDP.

- While farming accounts for just six percent of all jobs in rural America, for every person employed in farming there are seven more jobs in agribusiness, including wholesale and retail trade, processing, marketing, production, and distribution.

- Employment in goods production, which includes farming, forestry, fishing, mining and energy extraction, accounts for 11 percent of earnings in the nation's rural economy versus two percent in the urban economy.

- Manufacturing jobs account for 15 percent of earnings in the nation's rural economy versus nine percent in the urban economy.

- A United States Department of Agriculture (USDA) report found that "an effective transportation system supports rural economies, reducing the prices farmers pay for inputs such as seeds and fertilizers, raising the value of their crops and greatly increasing market access."

- Trucks provide the majority of transportation for agricultural products, accounting for 47 percent of total ton miles of travel compared to 37 percent by rail and eight percent by barge.

- The Council of State Governments found that "rural highways provide many benefits to the nation's transportation system, including serving as a bridge to other states, supporting the agriculture and energy industries, connecting economically challenged citizens in remote locations to employers, enabling the movement of people and freight, and providing access to America's tourist attractions."

- Transportation is becoming an even more critical segment of the food distribution network. While food demand is concentrated mostly in urban areas, food distribution is the most dispersed segment of the economy.

- A highly competitive and efficient transportation system can lead to lower food costs for U.S. consumers and higher market prices for producers due to lower shipping costs, smaller margins and more competitive export prices.

- A report by the Pacific Economic Cooperation Council recommends that governments improve the quality of their transportation systems serving the movement of goods from rural to urban regions as a strategy to lower food costs and increase economic prosperity.

- A report on agricultural transportation by the USDA found it likely that market changes and shifts in consumer preferences would further increase the reliance on trucking to move U.S. agricultural products.

RURAL CONNECTIONS TO TOURISM AND RECREATION

The condition and quality of the nation's highway system plays a critical role in providing access to America's many tourist destinations, particularly its scenic parks and recreational areas, which are mostly located in rural areas.

- America's 418 national parks, which are largely located in rural areas, received a record 318 million visitors in 2018, many in personal vehicles.

- In 2018, domestic and international travelers in the U.S. spent approximately $1.1 trillion.

- Travel and tourism spending in the U.S. in 2018 supported 8.9 million jobs.

RURAL ACCESS TO ENERGY SOURCES

Travel loads on America's rural roads are increasing, due partly to the booming energy extraction sector. This has been driven by increases in domestic oil and gas extraction, largely as a result of advancements in hydraulic fracturing (fracking), which has greatly increased the accessibility of shale oil and gas deposits, and the increased production of renewable energy such as wind and solar.

- Ethanol production in the U.S. increased from 1.6 billion gallons in 2000 to 16.1 billion gallons in 2018.

- U.S. production of liquid fuels, including crude oil and natural gas, increased 74 percent from 2000 to 2018, increasing liquid fuel's share of overall U.S. energy production (including coal and nuclear) from 48 to 63 percent.

- U.S. production of renewable energy, including wind and solar, increased 92 percent from 2000 to 2018, increasing renewable energy's share of overall U.S. energy production from nine to 12 percent.

- The development of significant new oil and gas fields in numerous areas, particularly in the North Central Plains, and increased agricultural production are placing increased traffic loads by large trucks on non-Interstate rural roads, which often have not been constructed to carry such high load volumes.

- The average travel per-lane-mile by large trucks on rural Interstate highways in the U.S. increased by 33 percent from 2000 to 2017.

RURAL TRANSPORTATION CHALLENGE: CONNECTIVITY

The potential for additional economic growth in many rural areas is being impeded by the failure to significantly modernize the nation's rural transportation system and provide for adequate connectivity.

- Sixty-six U.S. cities with a population of 50,000 or more do not have direct access to the Interstate Highway System (Appendix A).

- Rural transportation accessibility and connectivity are critical to transportation-dependent business sectors, including the growing energy production sector, advanced manufacturing and tourism. Many jobs located in urban areas also depend on economic input from rural communities.

- Since the routes for the Interstate Highway System were designated in 1956, the nation's population has nearly doubled, from 165 million to 327 million.

- The abandonment of more than 100,000 miles of rail lines in recent decades, mostly in rural areas, has reduced access in many rural communities and increased reliance on trucking for freight movement.

- A report by the American Association of State Highway and Transportation Officials (AASHTO) found that connectivity is particularly poor in rural portions of Western states because of the significant distance between Interstate highway routes and the lack of adequate rail service.

- Only 60 percent of rural counties nationwide have public transportation available. Twenty-eight percent of those have very limited service.

- Residents of rural areas often must travel longer distances to access education, employment, retail locations, social opportunities and health services. Rural residents also assume additional risks as a result of living in areas that may be farther from emergency response services including police, fire or medical assistance.

RURAL TRANSPORTATION CHALLENGE: SAFETY

Traffic fatalities on the nation's rural, non-Interstate roads occur at a rate approximately two-and-a-half times higher than on all other roads. A disproportionate share of fatalities take place on rural roads compared to the amount of traffic they carry.

- Rural, non-Interstate roads have a traffic fatality rate that is nearly two-and-a-half times higher than all other roads. In 2017, non-Interstate rural roads had a traffic fatality rate of 2.14 deaths for every 100 million vehicle miles of travel (VMT), compared to a fatality rate of 0.88 deaths per 100 million VMT on all other roads.

- Rural, non-Interstate routes accounted for 22 percent of all VMT in the U.S. in 2017. However, crashes on the nation's rural, non-Interstate routes resulted in 41 percent (15,205 of 37,133) of the nation's traffic deaths in 2017.

- The chart below identifies the 25 states that led the nation in the number of rural non-Interstate traffic deaths in 2017. Data for all states is available in Appendix B.

RANK	STATE	2017 Rural Non-Interstate Traffic Deaths
1	Texas	1,294
2	California	1,246
3	North Carolina	813
4	South Carolina	611
5	Florida	566
6	Alabama	527
7	Pennsylvania	527
8	Ohio	521
9	Georgia	512
10	Indiana	503
11	Kentucky	465
12	Virginia	463
13	Tennessee	435
14	Missouri	422
15	New York	419
16	Michigan	392
17	Mississippi	390
18	Oklahoma	376
19	Wisconsin	373
20	Illinois	341
21	Louisiana	320
22	Arkansas	287
23	Kansas	285
24	Arizona	270
25	Oregon	259

- The chart below identifies the 25 states with the highest rate of rural non-Interstate traffic fatalities per 100 million VMT, and the fatality rate per 100 million VMT on all other roads in the state in 2017. Data for all states is available in Appendix C.

RANK	STATE	Fatality Rate per 100M VMT on Rural Non-Interstates	Fatality Rate per 100M VMT on All Other Roads
1	South Carolina	3.60	0.98
2	California	3.16	0.77
3	Arizona	2.94	1.31
4	Rhode Island	2.57	0.92
5	West Virginia	2.55	0.97
6	Tennessee	2.55	0.93
7	Kentucky	2.54	1.02
8	Louisiana	2.48	1.21
9	Kansas	2.47	0.85
10	Oregon	2.44	0.68
11	North Carolina	2.43	0.70
12	Texas	2.38	1.11
13	Alabama	2.38	0.87
14	Georgia	2.36	1.00
15	Virginia	2.34	0.57
16	Delaware	2.33	0.74
17	Indiana	2.32	0.68
18	Oklahoma	2.24	0.86
19	Florida	2.23	1.32
20	Pennsylvania	2.18	0.79
21	New York	2.16	0.56
22	Arkansas	2.15	0.89
23	Colorado	2.13	0.98
24	Illinois	2.09	0.82
25	Montana	2.05	0.93

The higher traffic fatality rate found on rural non-Interstate routes is a result of multiple factors, including a lack of desirable roadway safety features, longer emergency vehicle response times, and the higher speeds traveled on rural roads compared to urban roads.

- Rural roads are more likely than urban roads to have roadway features that reduce safety, including narrow lanes, limited shoulders, sharp curves, exposed hazards, pavement drop-offs, steep slopes and limited clear zones along roadsides.

- Because many rural routes have been constructed over a period of years, they often have inconsistent design features for such things as lane widths, curves, shoulders and clearance zones along roadsides.

- Rural roads are more likely than urban roads to be two-lane routes. Eighty-six percent of the nation's rural non-freeway arterial roads have two-lanes, compared to 56 percent of urban non-freeway arterial routes.

- Rural roads are more likely than urban roads to have narrow lanes. A desirable lane width for collector and arterial roadways is at least 11 feet. Twenty-three percent of rural collector and arterial roads have lane widths of 10 feet or less, compared to 18 percent of urban collector and arterial roads.

- Most head-on crashes on rural, non-Interstate roads are likely caused by a motorist making an unintentional maneuver as a result of driver fatigue, being distracted or driving too fast in a curve.

- While driver behavior is a significant factor in traffic crash rates, both safety belt usage and impaired driving rates are similar in their involvement rate as a factor in urban and rural traffic crashes.

Many roadway safety improvements can be made to reduce serious crashes and traffic fatalities. These improvements are designed largely to keep vehicles from leaving the correct lane and to reduce the consequences of a vehicle leaving the roadway. Making needed roadway safety improvements would result in a significant reduction in traffic fatalities and serious injuries.

- The U.S. has a $146 billion backlog in needed roadway safety improvements, according to a 2017 report from the AAA Foundation for Traffic Safety. The report found implementing these cost-effective and needed roadway safety improvements on U.S. roadways would save approximately 63,700 lives and reduce the number of serious injuries as a result of traffic crashes by approximately 350,000 over 20 years.

- The type of safety design improvements that are appropriate for a section of rural road will depend partly on the nature of the safety problem on that section of road and the amount of funding available.

- **Low-cost** safety improvements include installing rumble strips along the centerline and sides of roads, improving signage and pavement/lane markings including higher levels of retroreflectivity, installing lighting, removing or shielding roadside obstacles, using chevrons and post-mounted delineators to indicate roadway alignment along curves, adding skid resistant surfaces at curves, and upgrading or adding guardrails.

- **Moderate-cost** improvements include adding turn lanes at intersections, resurfacing pavements and adding median barriers.

- **Moderate to high-cost** improvements include improving roadway alignment, reducing the angle of curves, widening lanes, converting conventional intersections to roundabouts, adding or paving shoulders, adding intermittent passing lanes, or adding a third or fourth lane.

- Systemic installation of cost-effective safety solutions and devices in rural areas helps to improve safety not just by targeting individual safety problem points on a road, but also making entire segments safer by improving those roadway segments that exhibit the characteristics that typically result in fatal or serious-injury crashes.

RURAL TRANSPORTATION CHALLENGES: DEFICIENT ROAD AND BRIDGE CONDITIONS

The nation's rural roads, highways and bridges have significant deficiencies and deterioration. Fourteen percent of the nation's rural roads have pavements in poor condition, and nearly one-in-ten of the nation's rural bridges need rehabilitation, repair or replacement.

- In 2017, 15 percent of the nation's major rural roads (arterials and collectors) were rated in poor condition, 21 percent were rated in mediocre condition, 17 percent were rated in fair condition and 47 percent were rated in good condition.

- The chart below ranks the 25 states with the greatest percentage of rural roads in poor condition in 2017. Rural pavement conditions for all states can be found in Appendix D.

RANK	STATE	Percentage of Rural Pavements in Poor Condition
1	Rhode Island	39%
2	California	32%
3	New Mexico	30%
4	West Virginia	30%
5	Hawaii	30%
6	Oklahoma	30%
7	Mississippi	27%
8	Alaska	22%
9	Maine	22%
10	New Hampshire	21%
11	Washington	21%
12	Pennsylvania	21%
13	Missouri	21%
14	Connecticut	20%
15	Louisiana	19%
16	Wisconsin	19%
17	Texas	18%
18	Massachusetts	17%
19	Michigan	16%
20	Vermont	16%
21	Colorado	14%
22	South Carolina	14%
23	Idaho	14%
24	Utah	14%
25	Minnesota	12%

- In 2018, nine percent of the nation's rural bridges were rated as poor/structurally deficient. Forty-six percent of rural bridges were rated fair and forty-six percent of rural bridges were rated in good condition. A bridge is rated poor/structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Poor/structurally deficient bridges are often posted for lower weight or closed to traffic, restricting or redirecting large vehicles, including commercial trucks, agricultural equipment, school buses and emergency services vehicles. A fair rating indicates that a bridge's structural elements are sound but minor deterioration has occurred to the bridge's deck, substructure or superstructure.

- The chart below ranks the 25 states with the highest share of rural bridges rated poor/structurally deficient in 2018. Rural bridge conditions for all states can be found in Appendix E.

RANK	STATE	Percent Rural Bridges Rated Poor/Structurally Deficient	Percent Rural Bridges Rated Fair	Percent Rural Bridges Rated Good
1	RHODE ISLAND	23%	58%	19%
2	IOWA	21%	42%	37%
3	WEST VIRGINIA	20%	52%	28%
4	PENNSYLVANIA	18%	50%	32%
5	SOUTH DAKOTA	18%	51%	32%
6	LOUISIANA	15%	36%	50%
7	MAINE	14%	55%	31%
8	NEW YORK	12%	49%	39%
9	NORTH CAROLINA	12%	49%	39%
10	OKLAHOMA	12%	44%	44%
11	MICHIGAN	12%	47%	41%
12	NORTH DAKOTA	11%	36%	53%
13	MISSISSIPPI	10%	27%	63%
14	ALASKA	10%	45%	44%
15	NEBRASKA	9%	39%	51%
16	MISSOURI	9%	47%	44%
17	NEW HAMPSHIRE	9%	41%	50%
18	MASSACHUSETTS	9%	56%	35%
19	NEW JERSEY	9%	61%	30%
20	CALIFORNIA	9%	39%	52%
21	SOUTH CAROLINA	9%	48%	43%
22	HAWAII	9%	55%	36%
23	WYOMING	8%	62%	30%
24	WISCONSIN	8%	40%	52%
25	ILLINOIS	8%	40%	53%

TRANSPORTATION OPPORTUNITIES IN RURAL AMERICA

America must adopt transportation policies that improve rural transportation connectivity, safety and conditions to provide the nation's small communities and rural areas with a level of safe and efficient access that will support quality of life and enhance economic productivity. TRIP recommends the following for an improved rural transportation system, based partially on findings and recommendations made by AASHTO, the National Highway Cooperative Research Program (NCHRP), the Council of State Governments (CSG) and the Ports-to-Plains Alliance.

Improve access and connectivity in America's small communities and rural areas

- ✓ Widen and extend key highway routes, including Interstates, to increase connectivity to smaller and emerging communities to facilitate access to jobs, education and healthcare, while improving access for agriculture, energy, manufacturing, forestry, tourism and other critical segments of the rural economy.

- ✓ An NCHRP report found that the construction of an additional 30,000 lane miles of limited access highways, largely along existing corridors, is needed to address the nation's need for increased rural connectivity.

- ✓ Modernize major two-lane roads and highways so they can accommodate increased personal and commercial travel.

- ✓ Improve public transit service in rural America to provide improved mobility for people without access to private vehicles.

Improve rural traffic safety

- ✓ Adequately fund needed rural roadway safety improvements and provide enhanced enforcement, education and improved emergency response to reduce the rate of rural traffic fatalities.

- ✓ Implement cost-effective roadway safety improvements, including rumble strips, shoulder improvements, lane widening, curve reductions, skid resistant surfaces at curves, passing lanes, intersection improvements and improved signage, pavement markings and lighting, guardrails and barriers, and improved shielding of obstacles.

Improve the condition of rural roads, highways and bridges

- ✓ Adequately fund local and state transportation programs to insure sufficient preservation of rural roads, highways and bridges to maintain transportation service and accommodate large truck travel, which is needed to support the rural economy.

FEDERAL TRANSPORTATION FUNDING

America's ability to address its rural transportation challenges would be greatly enhanced if Congress is able to provide a long-term, dedicated, user-based revenue stream capable of fully funding the federal surface transportation program. The current five-year federal surface transportation program includes modest funding increases and provides states with greater funding certainty, but falls far short of providing the level of funding needed to meet the nation's highway and transit needs.

- Signed into law in December 2015, the Fixing America's Surface Transportation Act (FAST Act), provides modest increases in federal highway and transit spending, allows states greater long-term funding certainty and streamlines the federal project approval process. But, the FAST Act does not provide adequate funding to meet the nation's need for highway and transit improvements and does not include a long-term and sustainable funding source.

- The five-year, $305 billion FAST Act will provide a boost of approximately 15 percent in national highway funding and 18 percent in national transit funding over the duration of the program, which expires in 2020.

- According to the 2015 Status of the Nation's Highways, Bridges and Transit: Conditions and Performance report submitted by the United States Department of Transportation (USDOT) to Congress, the nation faces an $836 billion backlog in needed repairs and improvements to the nation's roads, highways and bridges.

- The USDOT report found that the nation's current $105 billion investment in roads, highways and bridges by all levels of government should be increased by 35 percent to $142.5 billion annually to improve the conditions of roads, highways and bridges, relieve traffic congestion, and improve traffic safety.

All data used in this report is the most current available. Sources of information for this report include: The Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), the National Cooperative Highway Research Program (NCHRP), the American Association of State Highway and Transportation Officials (AASHTO), the United States Department of Agriculture (USDA), the Council of State Governments (CSG) and the U.S. Census Bureau.

Introduction

America's rural heartland is a vital part of the country, serving as a place to live and visit, and as a cultural and economic resource. The nation's rural transportation system plays a critical role in supporting the economy of rural America - particularly its agriculture, energy, manufacturing and tourism sectors - and connecting the nation's heartland to urban America.

Roads, bridges and highways are the backbone of the nation's rural transportation system, supporting its growing economy and providing daily mobility for residents, businesses and visitors. The condition, safety and efficiency of the nation's rural roads and bridges all play a critical role in the quality of life in rural and urban America. The nation's rural transportation system provides mobility for rural residents and visitors while linking urban America with the source of much of its food supply, energy and other natural resources.

Good transportation is essential to rural areas to provide access to jobs, to facilitate the movement of goods and people, to access health care and opportunities for educational skills, and to provide links to other social services. Transportation supports businesses and is a critical factor in a company's decision to locate or expand business operations. For communities that rely on tourism and natural amenities to help support their economy, transportation is the key link between visitors and destinations.

Many of the transportation challenges facing rural America are similar to those in urbanized areas. However, rural residents tend to rely more heavily on their limited transportation network – primarily rural roads and highways - than their counterparts in more urban areas.

The importance of rural transportation is likely to increase in the future as more people choose to live in rural America and the reliance on rural transportation systems to transport products and people to and from rural areas increases. Making needed improvements to the nation's rural transportation system will be critical in supporting quality of life and economic development of rural America and the entire nation.

AMERICA'S HEARTLAND

The U.S. Census Bureau defines rural areas as regions outside of urban areas with a population of 2,500 or more.[1] According to the U.S. Census Bureau definition, approximately 60 million people - 19 percent of the nation's population live in rural areas.[2]

Rural areas cover 97 percent of the nation's land area and are home to the vast majority of the nation's 2.2 million farms.[3]

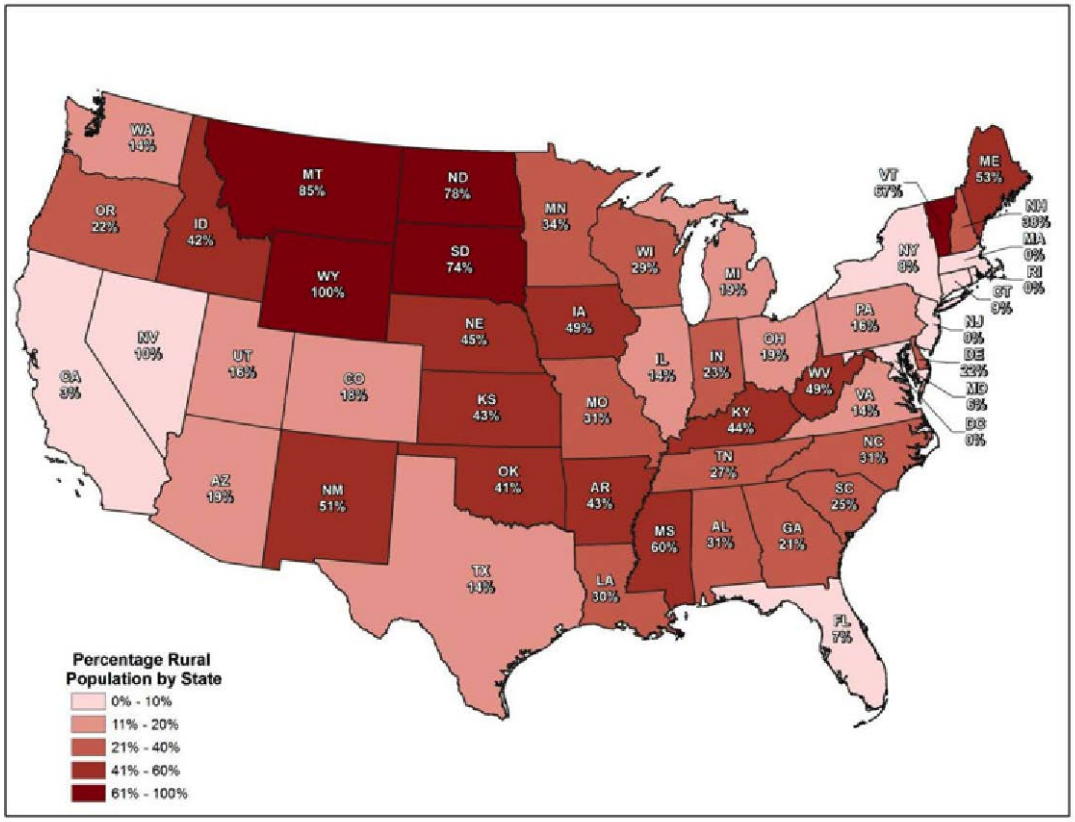
America's rural population declined slightly from 2010 to 2016 before increasing in 2017, adding an additional 33,000 people.[4] The modest rebound in rural population appears tied to increased employment and declining poverty in rural America.[5]

The number of jobs in rural America increased by 370,000 from 2013 to 2017, while the rural unemployment rate has decreased steadily from 10.3 percent in 2010 to 4.4 percent in 2017.[6]

The improved economy in rural America has resulted in a reduction in the rural poverty rate, which is the percentage of people making below the amount of money deemed necessary to have a basic standard of living. The rural poverty rate decreased from 18.4 percent in 2013 to 16.4 percent in 2017.[7]

The highest proportions of rural populations are located in the upper Midwest and West, though states throughout the nation have sizeable rural populations. The chart below details the percentage of rural population in each state.

Chart 1. Share of rural population in each state



Source: Federal Highway Administration.

The rural U.S. population is older than the nation as a whole, with 19 percent of those living in rural areas aged 65 years or older, compared to 15 percent of people living in urban areas.[8]

Growth in rural areas, particularly in the South and West, has also been fueled by significant domestic and international migration to regions that offer affordable housing, small-town quality of life and desirable natural amenities or climate, yet are within commuting distances of larger metropolitan areas.[9] A continued movement of retiring baby boomers to rural America is considered likely as aging Americans seek out communities that have these qualities.[10]

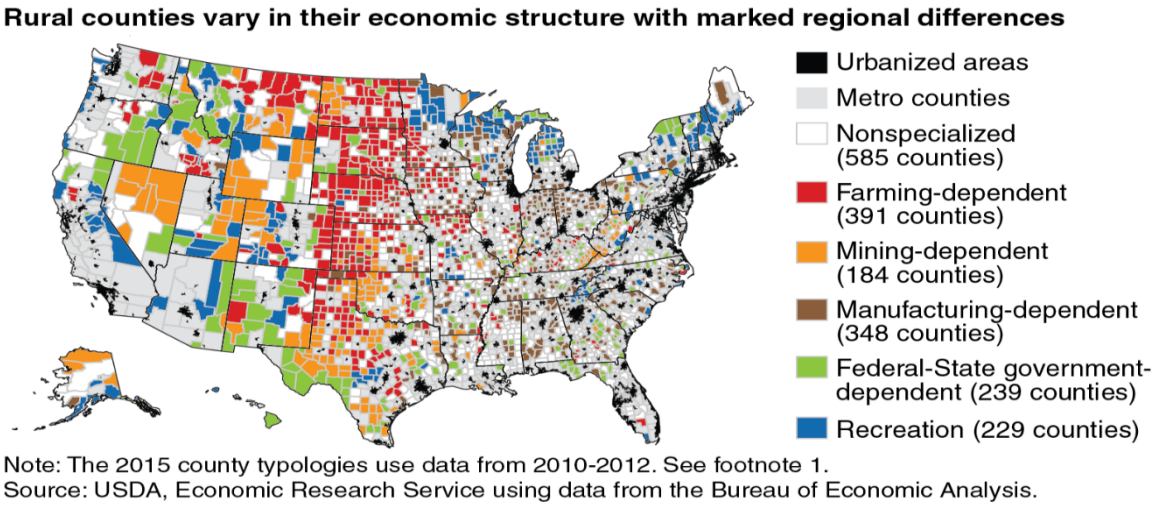
TRANSPORTATION'S CRITICAL IMPORTANCE TO THE RURAL ECONOMY

The quality of life in America's small communities and rural areas and the health of the nation's rural economy, from the production and transport of energy, food and fiber, to attracting tourism, is highly reliant on the quality of the nation's transportation system.

The nation's rural economy is far more reliant on goods production and manufacturing than the urban economy. Employment in goods production, which includes farming, forestry, fishing, mining and energy extraction, accounts for 11 percent of earnings in the nation's rural economy versus two percent in the urban economy.[11] Similarly, manufacturing jobs account for 15 percent of earnings in the nation's rural economy versus nine percent in the urban economy.[12]

Rural America is economically diverse, and while most rural counties offer employment in a variety of industries, they differ in their industry mix. The Economic Research Service (ERS) of the United States Department of Agriculture has classified predominantly rural counties in six mutually exclusive categories that reflect the industry that most supports its economy. In the following chart, the ERS classifies rural counties based on their dominant economic sector.

Chart 3. Rural Counties Classified by Dominant Economic Sector



Source: USDA, Economic Research Service

America's rural roads, highways and bridges provide the first and last link in the supply chain from farm to market and other retail outlets. Freight mobility and efficiency are fundamental to rural economic vitality and prosperity. Economic growth and stability in rural areas is heavily reliant on the ability to move raw materials into, or the value-added products out of, these areas.

Good rural transportation is critical to transportation-dependent business sectors including the growing energy production sector, advanced manufacturing, and tourism. Many jobs located in urban areas also depend upon good access to economic inputs from rural areas.

A USDA report found that "an effective transportation system supports rural economies, reducing the prices farmers pay for inputs such as seeds and fertilizers, raising the value of their crops and greatly increasing market access. The economics of rural areas are intertwined. As agriculture thrives, so does its supporting communities. An efficient system of freight transportation is an important foundation for a vibrant rural economy, including rural manufacturing."[13]

While farming accounts for just six percent of all jobs in rural America, for every person employed in farming there are seven more jobs in agribusiness, including wholesale and retail trade, processing, marketing, production and distribution.[14]

Agriculture, food, and related industries, including food and beverage manufacturing, apparel manufacturing and food and beverage stores and establishments, which rely on agricultural inputs, contributed $1.05 trillion to the U.S. gross domestic product GDP in 2016 – 5.7 percent of overall U.S. GDP.[15]

Trucks provide the majority of transportation for agricultural products, accounting for 47 percent of total ton-miles of travel, compared to 37 percent by rail, eight percent by barge and eight percent by mixed modes. [16]

A report from The Council of State Governments found that "rural highways provide many benefits to the nation's transportation system, including serving as a bridge to other states, supporting the agriculture and energy industries, connecting economically challenged citizens in remote locations to employers, enabling the movement of people and freight and providing access to America's tourist attractions."[17]

The importance of a good rural transportation system to the efficiency of a region's economic performance is increasing as food distribution becomes more dependent on reliable transportation. A report by the Pacific Economic Cooperation Council found that transportation is becoming an even more critical segment of the food distribution network as food distribution is the most dispersed segment of the economy, while food demand is concentrated mostly in urban areas. The report recommends that governments improve the quality of their transportation systems serving the movement of goods from rural to urban regions as a strategy to lower food costs and increase economic prosperity.[18]

A highly competitive and efficient transportation system can lead to lower food costs for U.S. consumers and higher market prices for producers due to lower shipping costs, smaller margins and more competitive export prices.[19]

A report on agricultural transportation by the USDA found it likely that market changes and changes in consumer preferences would further increase the reliance on trucking to move U.S. agricultural products. The USDA report found that future foreign demand for U.S. agricultural products will increasingly be for processed products, such as flour, which rely on increased domestic transportation. Consumer demands in the U.S. and the need for greater traceability of where and how an agricultural product was produced will also increase the need for smaller, time-sensitive delivery.

The USDA report found that for agricultural products, “movements toward lower volumes of trait-specific commodities will likely favor trucks as the primary mode of transport.”[20]

The condition and quality of the nation’s highway system also play a critical role in providing access to America's many tourist destinations, particularly its scenic parks and recreational areas, which are mostly located in rural areas. In 2018, domestic and international travelers in the U.S. spent approximately $1.1 trillion.[21] Travel and tourism spending in the U.S. in 2018 supported 8.9 million jobs.[22] America’s 418 national parks, which are largely located in rural areas, received 318 million visitors in 2018, many in personal vehicles.[23]

For many Americans, the primary reason to visit rural communities is to access tourist activities. America’s rural landscape boasts activities including hiking, golfing, biking, hunting, fishing, skiing, and water sports, while attracting visitors through its beaches, national and state parks, wineries, orchards and other national amenities. A poll by the Travel Industry of America Association found that 86 percent of trips taken by Americans to visit a rural area were for leisure purposes.[24] The viability of rural tourism in a region is also tied partly to the level of highway access.[25]

Increases in domestic oil and gas extraction, largely as a result of advancements in hydraulic fracturing (fracking), have greatly increased the accessibility of shale oil and gas deposits. This increase, along with the heightened production of renewable energy such as wind and solar, are creating additional travel loads on the nation’s rural highways.

Ethanol production in the U.S. increased from 1.6 billion gallons in 2000 to 16.1 billion gallons in 2018.[26]U.S. production of liquid fuels, including crude oil and natural gas, increased 74 percent from 2000 to 2018, increasing liquid fuel’s share of overall U.S. energy production from 48 to 63 during that time.[27]

U.S. production of renewable energy, including wind and solar, increased 92 percent from 2000 to 2018, increasing renewable energy's share of overall U.S. energy production from nine to 12 percent during that time.[28]

The development of significant new oil and gas fields in numerous areas, particularly in the North Central Plains, and increased agricultural production are placing significantly greater traffic loads by large trucks on non-Interstate rural roads. Oftentimes, these roads have not been constructed to carry such high load volumes. Travel per-lane mile by large trucks on U.S. rural Interstate highways increased by 33 percent from 2000 to 2017.[29]

Rural Transportation Challenge: Connectivity

Growing economic activity in rural America combined with the failure to significantly expand the nation's rural transportation system, particularly its network of modern highways, has resulted in a lack of adequate connectivity. This lack of mobility and connectivity is impeding the potential for economic growth in many rural areas.

Residents of rural areas often must travel longer distances to access education, employment, retail locations, social opportunities, and health services. Rural residents also assume additional risks as a result of living in areas that may be farther from police, fire or emergency medical services.[30]
The Interstate Highway System is the most critical highway link for commerce and intercity travel in rural America. But many rural and smaller communities in the U.S. are not adequately served by the Interstate system. Since the routes for the Interstate Highway System were designated in 1956, the nation's population has nearly doubled, from 165 million to 327 million, and is projected to increase to 420 million people by 2050.[31]

A report by AASHTO found that 66 areas in the United States with populations of at least 50,000 people are not connected to the Interstate System (Appendix A).[32] This lack of connection to the nation's major highway system reduces the economic competitiveness of these communities and their surrounding rural areas. "Maintaining connectivity is essential not only to serve rural communities, but also to support the shifting agricultural and energy extraction and production needs of a growing population and economy," the report found.[33]

The report by AASHTO also found that connectivity is particularly poor in rural portions of Western states because of the significant distance between Interstate highway routes and the lack of adequate rail service.[34] The lack of connectivity in rural America has been exacerbated by the continued reduction in the areas served by railroads as a result of the abandonment of un-profitable or lightly used rail lines. Over the last few decades, more than 100,000 miles of rail lines have been abandoned, mostly in rural areas, reducing access in many rural communities and increasing reliance on trucking for freight movement.[35] This loss of rail service reduces transport options, particularly for farmers.

According to the AASHTO report, a lack of adequate rural public transit greatly impacts people without access to private vehicles, including those with lower incomes and older people who live in rural America.[36] Rural transit, which often takes the form of specialized services such as van pools tailored to access employment and healthcare, often fails to meet the needs of rural Americans. Only 60 percent of rural counties nationwide have public transportation available and 28 percent of those have very limited service.[37]

Rural Transportation Challenge: Safety

Traffic crashes are a major source of fatalities in the U.S., particularly in rural America. The nation's rural, non-Interstate roads have the highest rate of traffic fatalities. Rural Interstate routes were excluded from the safety analysis in this report because they are built to very high safety standards and do not have the significant traffic safety problems common on many rural roads.

In 2017, traffic crashes claimed the lives of 37,133 people in the U.S. Traffic crashes on the nation's non-Interstate rural roads resulted in 15,205 fatalities in 2017-- 41 percent of all traffic fatalities in the U.S. The nation's non-Interstate rural roads carried only 22 percent of all vehicle miles of travel (VMT)in 2017.[38]

The fatality rate on rural non-Interstate routes in 2017 was 2.14 deaths for every 100 million VMT, nearly two-and-a-half times higher than the fatality rate of 0.88 fatalities per 100 million VMT on all other routes.[39] The overall fatality rate for all U.S. roads in 2017 was 1.16 fatalities per 100 million VMT.[40]

The five states with the largest number of fatalities as a result of crashes on rural, non-Interstate roads in 2017 were Texas, California, North Carolina, South Carolina and Florida. State-by-state data on the number of traffic fatalities occurring on rural, non-Interstate routes in 2017 and their share of overall fatalities and VMT can be found in Appendix B.

Chart 4. States with greatest number of fatalities in crashes on non-Interstate rural roads in 2017.

RANK	STATE	2017 Rural Non-Interstate Traffic Deaths
1	Texas	1,294
2	California	1,246
3	North Carolina	813
4	South Carolina	611
5	Florida	566
6	Alabama	527
7	Pennsylvania	527
8	Ohio	521
9	Georgia	512
10	Indiana	503
11	Kentucky	465
12	Virginia	463
13	Tennessee	435
14	Missouri	422
15	New York	419
16	Michigan	392
17	Mississippi	390
18	Oklahoma	376
19	Wisconsin	373
20	Illinois	341
21	Louisiana	320
22	Arkansas	287
23	Kansas	285
24	Arizona	270
25	Oregon	259

Source: TRIP analysis of National Highway Traffic Safety Administration data.

The state with the highest rate of traffic fatalities on its non-Interstate, rural routes in 2017 was South Carolina, with 3.60 traffic fatalities per 100 million VMT.[41] California, Arizona, Rhode Island and West Virginia experienced the next highest rates of traffic fatalities on their non-Interstate, rural roads. State-by-state data on traffic fatality rates on rural, non-Interstate routes and all other routes can be found in Appendix C.

Chart 5. States with highest rate of traffic fatalities on rural, non-Interstate routes per 100 million VMT in 2017 and fatality rate on all other roads in the state in 2017.

RANK	STATE	Fatality Rate per 100M VMT on Rural Non-Interstates	Fatality Rate per 100M VMT on All Other Roads
1	South Carolina	3.60	0.98
2	California	3.16	0.77
3	Arizona	2.94	1.31
4	Rhode Island	2.57	0.92
5	West Virginia	2.55	0.97
6	Tennessee	2.55	0.93
7	Kentucky	2.54	1.02
8	Louisiana	2.48	1.21
9	Kansas	2.47	0.85
10	Oregon	2.44	0.68
11	North Carolina	2.43	0.70
12	Texas	2.38	1.11
13	Alabama	2.38	0.87
14	Georgia	2.36	1.00
15	Virginia	2.34	0.57
16	Delaware	2.33	0.74
17	Indiana	2.32	0.68
18	Oklahoma	2.24	0.86
19	Florida	2.23	1.32
20	Pennsylvania	2.18	0.79
21	New York	2.16	0.56
22	Arkansas	2.15	0.89
23	Colorado	2.13	0.98
24	Illinois	2.09	0.82
25	Montana	2.05	0.93

Source: TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data.

Traffic Safety Factors

Key factors that contribute to fatal traffic crashes include the following: human behavior, safety features of the vehicle, emergency response times, medical care of the victims, and the safety design

of the roadway. [42] Human behavioral issues can include the use of safety belts, driver impairment due to alcohol or drugs, distracted or drowsy driving, and speeding. Because rural roads have fewer intersections than urban roads and are more likely to provide travel between urban areas, they often have higher speed limits than many urban routes. Because rural traffic crashes often occur in more remote locations than urban crashes, emergency medical care following a serious accident is often slower in arriving, contributing to a higher traffic fatality rate on rural roads.

Traffic fatality rates on rural roads are higher than on urban roads, partly because rural roads are less likely to have adequate safety features and are more likely than urban roads to have two lanes. Eighty-six percent of the nation's major, rural non-freeway roads and highways are two-lane routes, while 56 percent of urban, major non-freeway roads and highways are two-lane routes.[43]

Rural routes have often been constructed over a period of years. As a result they often have inconsistent design features for such things as lane widths, curves, shoulders and clearance zones along roadways.[44] Many rural roads have been built with narrow lanes, limited shoulders, excessive curves and steep slopes alongside roadways.[45]

While a desirable lane width for collector and arterial roadways is at least 11 feet, 23 percent of rural collector and arterial roads have lane widths of 10 feet or less, compared to 18 percent of urban collector and arterial roads.[46] With passenger vehicle, heavy truck and commercial farming traffic increasing, the safety inadequacies of these rural roads are contributing to the higher rate of fatal crashes on rural roads.

The vast majority of rural, non-interstate traffic fatalities – 91 percent – occur on two-lane roads.[47] A report on head-on collisions by the National Cooperative Highway Research Program found

that "most head-on crashes are likely to result from a motorist making an 'unintentional' maneuver – the driver falls asleep, is distracted, or travels too fast in a curve."[48]

Making Rural Roads Safer

A report on rural road safety by the United States General Accounting Office (GAO) found that several factors hinder efforts to improve rural road safety. The GAO report noted that these challenges include the large number of rural roads and the relatively low volume of traffic they carry, combined with the high cost of some desirable improvement. The GAO report also found federal highway funding cannot be used on many rural roads, most of which are the responsibility of local governments, which may have limited resources.[49]

The U.S. has a $146 billion backlog in needed roadway safety improvements, according to a 2017 report from the AAA Foundation for Traffic Safety. The report found implementing these cost-effective and needed roadway safety improvements on U.S. roadways would save approximately 63,700 lives and reduce the number of serious injuries as a result of traffic crashes by approximately 350,000 over 20 years.

A variety of design improvements can help improve rural road safety. The goal of these improvements is to keep vehicles in the correct lane and minimize the consequences of vehicles leaving the roadway. The type of safety design improvements that are appropriate for a section of rural road will depend partly on the amount of funding available and the nature of the safety problem on that section of road. Several studies have classified rural safety improvements by both their effectiveness and their cost. These improvements include:

LOW COST:

Rumble strips – Rumble strips are raised or grooved patterns constructed on the roadway's shoulder. They have been found to reduce run-off-the-road crashes by 25 to 43 percent.[50]

Centerline rumble strips – Several states have started to install centerline rumble strips to alert drivers who may be encroaching or have strayed into an opposing lane.

Improved signage and pavement markings, including higher levels of retroreflectivity –Traffic signs and pavement markings represent the first line of crucial information for drivers and can help improve night-time visibility. Signs with greater retroreflectivity, more visible pavement markings and raised, reflective lane makings can all help drivers to stay on a roadway, particularly at night.

Lighting – A study of the addition of street lighting at 49 isolated rural intersections in Minnesota found that nighttime crashes decreased by 35 percent after the addition of lighting.[51]

Removing or shielding road-side obstacles – Trees, large rocks, utility poles, heavy mail boxes and other road-side objects can be shielded or moved away from the road to reduce the likelihood that a vehicle leaving the roadway would strike these objects.

Upgrade or add guardrails – Adding or improving guardrails has been found to reduce traffic fatality rates by 50 to 58 percent.[52]

Chevrons and post-mounted delineators along curves – The use of chevrons or post-mounted delineators to indicate roadway alignment have been found to be effective in reducing crashes at curves by providing drivers with better visual cues about the presence and geometry of a curve.[53]

MODERATE COST:

Install median barriers – Median barriers have been found to reduce traffic fatality rates by 65 percent.[54]

Adding turn lanes at intersections – The addition of left turn lanes at rural intersections was found to reduce crashes by 33 to 48 percent.[55] The addition of right turn lanes at intersections was found to reduce crashes by eight to 26 percent.[56]

Resurfacing pavements - Resurfaced pavements have been found to result in a 25 percent reduction in fatal crashes. [57]

MODERATE TO HIGH COST:

Add or pave shoulders – Paving or widening shoulders has been found to reduce traffic fatality rates by 10 to 35 percent, depending on the width of the widening and the location.[58]

Improved roadway alignment – Realigning roadways has been found to average a 50 percent reduction in traffic fatality rates.[59]

Construct intermittent passing lanes or two-way left-turn lane – Adding passing lanes has been found to reduce traffic fatality rates by 20 percent, while the addition of a two-way left-turn lane has been found to reduce traffic fatality rates by 30 percent.[60]

Converting Conventional Intersections to Roundabouts –Converting a stop-controlled intersection to a roundabout can reduce injury crashes by 82 percent, while converting a signalized intersection to a roundabout can reduce injury crashes by 78 percent.[61]

Widen lanes – Making lanes wider has been found to reduce traffic fatality rates by eight to 10 percent. [62]

Add lanes – A report on the likely safety benefit of converting two-lane rural roads into four-lane routes found that traffic accident rates would be reduced by 40 to 60 percent.[63]

The use of Roadway Safety Assessments (RSAs) is a proven approach that can improve safety on rural roads. Improved data collection on rural road safety can help to identify roadway segments with dangerous characteristics.

Systemic installation of cost-effective safety solutions and devices in rural areas helps to improve safety not just by targeting problem points on a road, but also making entire segments safer by improving those roadway segments that exhibit the characteristics that typically result in fatal or serious-injury crashes.

Rural Transportation Challenge: Road Conditions

The life cycle of America's rural roads is greatly affected by the ability of the transportation agency responsible for their upkeep to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible. The pavement condition of the nation's major roads is evaluated and classified as being in poor, mediocre, fair or good condition.

In 2017, 15 percent of the nation's major rural roads were rated in poor condition, 21 percent were rated in mediocre condition, 17 percent were rated in fair condition and 47 percent were rated in good condition.[64] Roads rated poor may show signs of deterioration, including rutting, cracks and potholes. In some cases, poor roads can be resurfaced but often are too deteriorated and must be reconstructed. Roads rated in mediocre and fair condition may show signs of significant wear and may also have some visible pavement distress. Most pavements in mediocre and fair condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition.

The states with the largest share of their rural roads with pavements in poor condition are Rhode Island, California, New Mexico, West Virginia and Hawaii. Rural pavement conditions for all states can be found in Appendix D.

Chart 6. States with Highest Share of Major Rural Roads Rated in Poor Condition

RANK	STATE	Percentage of Rural Pavements in Poor Condition
1	Rhode Island	39%
2	California	32%
3	New Mexico	30%
4	West Virginia	30%
5	Hawaii	30%
6	Oklahoma	30%
7	Mississippi	27%
8	Alaska	22%
9	Maine	22%
10	New Hampshire	21%
11	Washington	21%
12	Pennsylvania	21%
13	Missouri	21%
14	Connecticut	20%
15	Louisiana	19%
16	Wisconsin	19%
17	Texas	18%
18	Massachusetts	17%
19	Michigan	16%
20	Vermont	16%
21	Colorado	14%
22	South Carolina	14%
23	Idaho	14%
24	Utah	14%
25	Minnesota	12%

Source: TRIP analysis of Federal Highway Administration Data.

A desirable goal for state and local organizations that are responsible for road maintenance is to keep 75 percent of major roads in good condition.[65] Only 47 percent of major rural roads had pavements that were in good condition in 2017.[66]

Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are even more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.[67]

As the nation's major rural roads and highways continue to age, they will reach a point where routine paving and maintenance will not be adequate to keep pavement surfaces in good condition and costly reconstruction of the roadway and its underlying surfaces will become necessary.

Rural Transportation Challenge: Bridge Conditions

The nation's rural bridges form key links in the highway system, providing communities and individuals access to employment, schools, shopping and medical services, and facilitating commerce and access for emergency vehicles. In 2018, nine percent of the nation's rural bridges were rated as poor/structurally deficient and 46 percent were rated fair.[68]

A bridge is poor/structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. A fair rating indicates that a bridge's structural elements are sound but minor deterioration has occurred to the bridge's deck, substructure or superstructure. Bridges that are structurally deficient may be posted for lower weight limits or closed if their condition

warrants such action. Deteriorated bridges can have a significant impact on daily life. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid posted bridges. Redirected trips lengthen travel time, waste fuel and reduce the efficiency of the local economy.

With more than one-fifth of its rural bridges – 23 percent – rated structurally deficient, Rhode Island has the highest share in the nation, followed by Iowa, West Virginia, Pennsylvania and South Dakota.[69] Rural bridge conditions for all states can be found in Appendix E.

Chart 7. States with Highest Share of Rural Bridges Rated Poor/Structurally Deficient (2018).

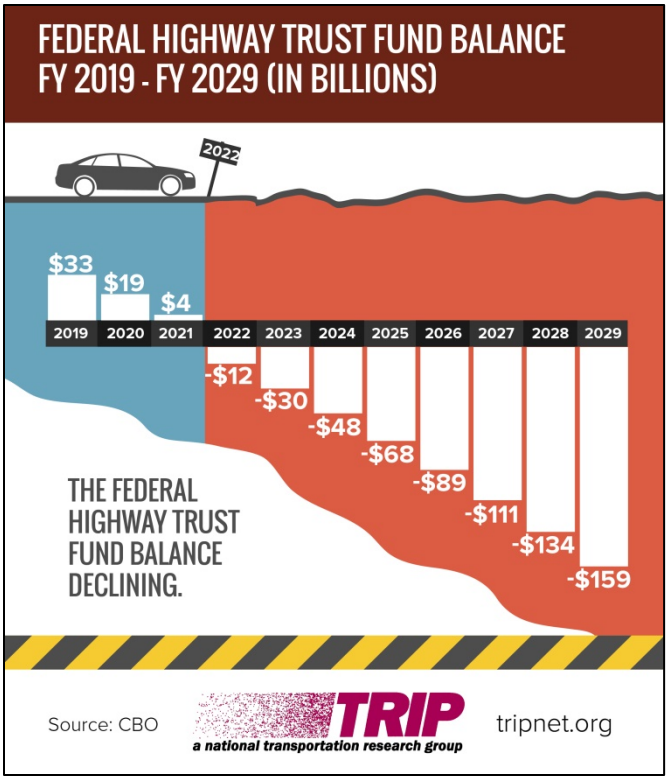
RANK	STATE	Percent Rural Bridges Rated Poor/Structurally Deficient	Percent Rural Bridges Rated Fair	Percent Rural Bridges Rated Good
1	RHODE ISLAND	23%	58%	19%
2	IOWA	21%	42%	37%
3	WEST VIRGINIA	20%	52%	28%
4	PENNSYLVANIA	18%	50%	32%
5	SOUTH DAKOTA	18%	51%	32%
6	LOUISIANA	15%	36%	50%
7	MAINE	14%	55%	31%
8	NEW YORK	12%	49%	39%
9	NORTH CAROLINA	12%	49%	39%
10	OKLAHOMA	12%	44%	44%
11	MICHIGAN	12%	47%	41%
12	NORTH DAKOTA	11%	36%	53%
13	MISSISSIPPI	10%	27%	63%
14	ALASKA	10%	45%	44%
15	NEBRASKA	9%	39%	51%
16	MISSOURI	9%	47%	44%
17	NEW HAMPSHIRE	9%	41%	50%
18	MASSACHUSETTS	9%	56%	35%
19	NEW JERSEY	9%	61%	30%
20	CALIFORNIA	9%	39%	52%
21	SOUTH CAROLINA	9%	48%	43%
22	HAWAII	9%	55%	36%
23	WYOMING	8%	62%	30%
24	WISCONSIN	8%	40%	52%
25	ILLINOIS	8%	40%	53%

Source: TRIP analysis of Federal Highway Administration data.

The service life of bridges can be extended by performing routine maintenance such as resurfacing decks, painting surfaces, ensuring that a facility has good drainage and replacing deteriorating components. But most bridges will eventually require more costly reconstruction or major rehabilitation to remain operable.

Rural Transportation Funding

Investment in the nation's rural roads, highways and bridges is funded by local, state and federal governments. Federal funds for highway and transit improvements are provided through the federal Highway Trust Fund, which raises revenue through federal user fees, largely an 18.4 cents-per-gallon tax on gasoline and a 24.4 cents-per-gallon tax on diesel fuel.



Signed into law in December 2015, the Fixing America's Surface Transportation Act (FAST Act), provides modest increases in federal highway and transit spending. The five-year bill also provides states with greater funding certainty and streamlines the federal project approval process. But, the FAST Act does not provide adequate funding to meet the nation's need for highway and transit improvements and does not include a long-term and sustainable funding source.

The five-year, $305 billion FAST Act will provide a boost of approximately 15 percent in highway funding and 18 percent in transit funding over the duration of the program, which expires in 2020.[70] In addition to federal motor fuel tax revenues, the FAST Act will also be funded by $70 billion in U.S. general funds, which will rely on offsets from several unrelated federal programs including the Strategic Petroleum Reserve, the Federal Reserve and U.S. Customs.

America's ability to address its rural transportation challenges would be greatly enhanced if Congress is able to provide a long-term, dedicated, user-based revenue stream capable of fully funding the federal surface transportation program.

According to the 2015 Status of the Nation's Highways, Bridges and Transit: Conditions and Performance report submitted by the USDOT to Congress, the nation faces an $836 billion backlog in needed repairs and improvements to the nation's roads, highways and bridges.[71]

The USDOT report found that the nation's current $105 billion investment in roads, highways and bridges by all levels of government should be increased by 35 percent to $142.5 billion annually to improve the conditions of roads, highways and bridges, relieve traffic congestion and improve traffic safety.

Transportation Opportunities in Rural America

Providing an adequate level of safe and efficient access in America's small communities and rural areas to support quality of life and enhance economic productivity will require that the nation adopt transportation policies that will improve rural transportation connectivity, safety and conditions.

The following recommendations by TRIP for an improved rural transportation system are also based partially on recommendations and findings of AASHTO, NCHRP, CSG and the Ports-to-Plains Alliance.

Improve access and connectivity in America's small communities and rural areas

- ✓ Widen and extend key highway routes, including Interstates, to increase connectivity to smaller and emerging communities to facilitate access to jobs, education and healthcare while improving

access for agriculture, energy, manufacturing, forestry, tourism and other critical segments of the rural economy.

- ✓ An NCHRP report found that the construction of an additional 30,000 lane miles of limited access highways, largely along existing corridors, is needed to address the nation's need for increased rural connectivity.
- ✓ Modernize major two-lane roads and highways so they can accommodate increased personal and commercial travel.
- ✓ Improve public transit service in rural America to provide improved mobility for people without access to private vehicles.

Improve rural traffic safety

- ✓ Adequately fund needed rural roadway safety improvements and provide enhanced enforcement, education and improved emergency response to reduce the rate of rural traffic fatalities.
- ✓ Roadway safety improvements may include rumble strips, shoulder improvements, lane widening, curve reductions, passing lanes, intersection improvements and improved signage and lighting, and improved shielding of obstacles.

Improve the condition of rural roads, highways and bridges

- ✓ Adequately fund local and state transportation programs to insure sufficient preservation of rural roads, highways and bridges to maintain transportation service and accommodate large truck travel, which is needed to support the rural economy.

Conclusion

Rural roads and bridges are a critical link in the nation's transportation system, providing access to natural resources and the energy, food and fiber that drives the nation's economic engine. In a rural America that is experiencing economic and population growth and that is highly transportation reliant, the transportation system plays a critical role in connecting communities to America's urban areas, supporting commerce, commuting and tourism. The nation's rural transportation system, particularly its roads and bridges, faces significant challenges. The rural transportation network carries increasing levels of traffic, fails to provide adequate connectivity for many communities, has significant deterioration and has significantly higher rates of serious traffic crashes than other roads.

Providing the nation with a rural transportation system that will support the economy and future development will require that the U.S. invest in a rural transportation system that is safe, efficient, and well-maintained, and that provides adequate mobility and connectivity to the nation's rural communities.

###

ENDNOTES

[1] Highway Functional Classification Concepts, Criteria and Procedures (2013). Federal Highway Administration. http://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/

[2] United States Census Bureau (2016). New Census Data Show Differences Between Urban and Rural Populations. https://www.census.gov/newsroom/press-releases/2016/cb16-210.html

3. Ibid and United States Department of Agriculture. Economic Research Service. http://www.ers.usda.gov/topics/rural-economy-population/population-migration.aspx

[4] United States Department of Agriculture. (2018). Rural America at a Glance 2018 Edition. https://www.ers.usda.gov/webdocs/publications/90556/eib-200.pdf

[5] Ibid.

[6] Ibid.

[7] Ibid.

[8] Ibid.

[9] Slow Going for the Population in Rural America (2004). M. Mather and J. D'Amico. Population Reference Bureau.

[10] Economic Research Service, United States Department of Agriculture (2009). Baby Boom Migration and its Impact on Rural America.

[11] United States Department of Agriculture. Economic Research Service (2016). Rural America at a Glance 2016 Edition. https://www.ers.usda.gov/webdocs/publications/80894/eib-162.pdf?v=42684

[12] Ibid.

[13] United States Department of Agriculture, (2010). Study of Rural Transportation Issues. Ch. 3. https://www.ams.usda.gov/services/transportation-analysis/rti

[14] A Guide to Food and Fiber Literacy, Oklahoma State University. (1998).

[15] United States Department of Agriculture, Economic Research Service (2018). Agriculture and its Related Industries added over $1 Trillion to U.S. GDP in 2016. https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=88969

[16] TRIP analysis of Federal Highway Administration's Freight Analysis Framework data (2019). Data is for 2017. https://faf.ornl.gov/fafweb/

[17] Rural Transportation Needs (2011). Council of State Governments. ES-1.

[18] The Role of Transportation Infrastructure in a Seamless Food System, Pacific Food System Outlook 2004-2005. https://www.pecc.org/resources/foodagriculture-1/638-pacific-food-system-outlook-the-role-of-transportation-infrastructure-in-a-seamless-food-system/file

[19] Transportation Impact of Changing Patterns of Production and Domestic and Global Distribution of Agricultural Products. Federal Highway Administration. p. 3

[20] U.S. Agriculture and Transportation: Challenges & Opportunities for the 21st Century. 2000. United States Department of Agriculture. Based on the 2000 conference: "Agricultural Transportation Challenges of the 21st Century."

[21] U.S. Travel Association (2019). U.S. Travel and Tourism Overview (2018). https://www.ustravel.org/system/files/media_root/document/Research_Fact-Sheet_US-Travel-and-Tourism-Overview.pdf

[22] Ibid.

[23] National Park Service (2019). National Park Service Visitation Tops 318 Million in 2018. https://www.nps.gov/orgs/1207/03-05-2019-visitation-numbers.htm

[24] Miller R., & Washington, K., (2009) Rural and Small town Tourism. Travel and Tourism Market Research Handbook, P. 67-73.
[25] Gartner, W.C. (2004) Rural Tourism Development in the USA. International Journal of Tourism Research, 6. P. 151 – 164.
[26] Renewable Fuels Association (2019). Annual U.S. Fuel Ethanol Production. https://ethanolrfa.org/resources/industry/statistics/#1549569747568-e7db9c54-efe4
[27] U.S. Energy Administration (2019). Primary Energy Production by Source. Additional analysis provided by TRIP. https://www.eia.gov/totalenergy/data/monthly/
27. Ibid.
[29] Federal Highway Administration. Highway Statistics 2000 and 2017. See charts VM-1 and HM-60. Additional analysis by TRIP.
[30] Self Reported Satisfaction With Accessibility in Isolated Rural Areas. Federal Highway Administration. 2014.
[31] American Association of State Highway and Transportation Officials (2010). Transportation Reboot: Restarting America's Most Essential Operating System. The Case for Capacity: To Unlock Gridlock, Generate Jobs, Deliver Freight and Connect Communities. P. 37.
[32]Ibid.
[33] National Cooperative Highway Research Program, Transportation Research Board (2007). Future Options for the National System of Interstate and Defense Highways. ES-ii.
[34] American Association of State Highway and Transportation Officials (2010). Transportation Reboot: Restarting America's Most Essential Operating System. The Case for Capacity: To Unlock Gridlock, Generate Jobs, Deliver Freight and Connect Communities. P. 43.
[35] Ibid. P. 21.
[36] Ibid. P. 6.
[37] Rural Transportation Needs (2011). Council of State Governments. P. 2.
[38] TRIP analysis of NHTSA and Federal Highway Administration data (2018).
[39] Ibid.
[40] Ibid.
[41] Ibid.
[42] United States General Accounting Office. Highway Safety: Federal and state efforts to Address Rural Road Safety Challenges (2004). P. 2.
[43] Highway Statistics 2013, HM-55. Data is for arterial routes, excluding Interstates and other freeways and expressways. Federal Highway Administration.
[44] Rural Road Safety: A Global Challenge. Public Roads September/October 1999. Federal Highway Administration. P. 4.
[45] County Engineers Adopt Rural Road Safety Program. Minnesota Local Technical Assistance Program. 200
[46] Highway Statistics 2013, HM-60. Federal Highway Administration. Data excludes Interstates or Urban Other Freeways and Expressway.
[47] TRIP analysis of NHTSA data.

[48] Guidance for Implementation of the AASHTO Strategic Highway Safety Plan. Volume 4: A Guide for Addressing Head-on Collisions. 2003. National Cooperative Highway Research Program. NCHRP Report 500.. P. I-2.
[49] Federal and State Efforts to Address Rural Road Safety Challenges, May 2004. United States General Accounting Office. GAO-04-663. P. 25.
[50] Kentucky Transportation Center. Development of Procedures for Identifying High-Crash Locations and Prioritizing Safety Improvements. 2003. P. 23.
[51] Safety Impacts of Street Lighting at Isolated Rural Intersections. Isebrands, H., Hallmark, S., Hans, Z., McDonald, T., Iowa State/University/ Center for Transportation Research and Education.
[52] Kentucky Transportation Center. Development of Procedures for Identifying High-Crash Locations and Prioritizing Safety Improvements. 2003. P. 23.
[53] Volume 7: A Guide for Reducing Collisions on Horizontal Curves. National Cooperative Highway Research Program. Report 500. 2004. P. V-10.
[54] Ibid. P. 23.
[55] Safety Effectiveness of Intersection Left- and Right-Turn Lanes. Federal Highway Administration. 2002. Report No. FHWA-RD-02-103. P. 5.
[56] Ibid. P. 5.
[57] Ibid. P. 23.
[58] Ibid. 24.
[59] Ibid. P. 25.
[60] Ibid. P. 24.
[61] AAA Foundation for Traffic Safety. (2017). Safety Benefits of Highway Infrastructure Investments. P. 15.
[62] Ibid. P. 25.
[63] Kentucky Transportation Center. Development of Procedures for Identifying High-Crash Locations and Prioritizing Safety Improvements. 2003. P. 23.
[64] Federal Highway Administration. Highway Statistics 2015. HM-63, HM-64. Data is for all arterials, including Interstates and major collectors.
[65] Why We Must Preserve our Pavements, D. Jackson, J. Mahoney, G. Hicks, 1996 International Symposium on Asphalt Emulsion Technology.
[66] Federal Highway Administration: Highway Statistics 2017. HM-63, HM-64. Data is for all arterials, including Interstates and major collectors.
[67] Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
[68] U.S. Department of Transportation - Federal Highway Administration: National Bridge Inventory 2018.
[69] Ibid.
[70] 2015 "Fixing America's Surface Transportation Act." (2015) American Road and Transportation Builders Association. http://www.artba.org/newsline/wp-content/uploads/2015/12/ANALYSIS-FINAL.pdf
[71] United States Department of Transportation (2015). 2015 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance. Executive Summary, Chapter 8. https://www.fhwa.dot.gov/policy/2015cpr/es.cfm#8h