

RURAL CONNECTIONS: CHALLENGES AND OPPORTUNITIES IN AMERICA'S HEARTLAND



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Executive Summary

America's rural heartland is the primary source of many of the goods and products that support our nation's economy and way of life. It also is home to a significant share of the nation's population and many of its natural resources and popular tourist destinations. 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 around the globe. As the backbone of the nation's energy, food and fiber supply chain, the importance of America's rural transportation system was heightened during the response to the COVID-19 pandemic.

America's rural transportation network provides the first and last link in the supply chain from farm to market. 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. Safe, reliable transportation is essential in rural areas, where household vehicle travel is approximately 50 percent higher than in urban communities, to provide access to jobs, to facilitate the movement of goods and people, to access opportunities for health care and education, and to provide links to social services.

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.

The term rural areas in this report is 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 are 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.

Rural Americans tend to be more heavily reliant on their limited transportation network - primarily rural roads and highways - than their counterparts in urban areas.

- 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, 18 percent of the nation's population 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 two million farms.
- America's rural population declined by less than one percent (0.6) from 2010 to 2020, with the losses largely occurring in counties experiencing persistent poverty.

- America's rural economy is far more reliant on goods production, which includes farming, ranching, forestry, fishing, manufacturing, mining and energy extraction 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, with household vehicle travel in rural communities averaging approximately 50 percent higher than in urban communities. Residents of rural areas often must travel longer distances to access education, employment, retail locations, social opportunities and health services.
- The rural U.S. population is older than the nation as a whole, with an average age in rural areas of 49 years, compared to 46 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.
- 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 TRANSPORTATION CHALLENGES: FUNDING

Improving the safety, reliability and condition of the nation's rural roads, highways and bridges will require increased investment.

- An analysis of the [Status of the Nation's Highways, Bridges and Transit Conditions and Performance Report, 24rd Edition](#) report, submitted by the USDOT to Congress in 2021, indicates that the U.S. faces a \$180 billion backlog in needed repairs and improvements to the nation's rural roads, highways and bridges. This includes a \$109 billion backlog for rural road and highway rehabilitation, a \$35 billion backlog for needed rural bridge rehabilitation, and a \$36 billion backlog for needed rural roadway enhancements.
- The findings of the [report](#) indicate that the nation's annual \$21 billion investment in rural road, highway and bridge rehabilitation and enhancements by all levels of government should be increased by 38 percent, to approximately \$29 billion annually, to improve their condition, reliability and safety.
- Signed into law in November 2021, the bipartisan [Infrastructure Investment and Jobs Act](#) (IIJA) will provide a significant boost in federal investment in roads, bridges and transit and offers an opportunity for the nation to make progress in improving the safety, reliability and condition of America's transportation system. The IIJA will provide \$454 billion over the five-year period from 2022 to 2026 for investment in highways and transit, resulting in a 38 percent increase in federal investment in 2022.

- The IIJA includes a \$2 billion [Rural Surface Transportation Grant Program](#) that will support projects to improve and expand the surface transportation infrastructure in rural areas to increase connectivity, improve the safety and reliability of the movement of people and freight, and generate regional economic growth and improve quality of life.

RURAL TRANSPORTATION CHALLENGE: SAFETY

Traffic fatalities on the nation's rural, non-Interstate roads occur at a rate double that 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 double that on all other roads. In 2020, non-Interstate rural roads had a traffic fatality rate of 2.17 deaths for every 100 million vehicle miles of travel (VMT), compared to a fatality rate of 1.09 deaths per 100 million VMT on all other roads.
- Rural, non-Interstate routes accounted for 23 percent of all VMT in the U.S. in 2020. However, crashes on the nation's rural, non-Interstate routes resulted in 38 percent (14,582 of 38,824) of the nation's traffic fatalities in 2020.
- The chart below shows the 25 states that led the nation in the number of rural, non-Interstate traffic fatalities in 2020. Data for all states is available in [Appendix B](#).

States with Highest Number of Rural Non-Interstate Traffic Fatalities (2020)					
1	Texas	1,334	14	Tennessee	438
2	California	1,035	15	Virginia	425
3	North Carolina	779	16	Michigan	403
4	South Carolina	699	17	Wisconsin	358
5	Florida	629	18	Oklahoma	342
6	Georgia	594	19	Louisiana	341
7	Alabama	474	20	Illinois	305
8	Indiana	467	21	New York	273
9	Mississippi	458	22	Oregon	272
10	Missouri	457	23	Arizona	250
11	Kentucky	446	24	Kansas	238
12	Pennsylvania	442	25	Minnesota	226
13	Ohio	440	U.S. Total		14,582

- The chart below shows the 25 states with the highest rate of rural, non-Interstate traffic fatalities per 100 million VMT in 2020, and the fatality rate per 100 million VMT on all other roads in the state. Data for all states is available in [Appendix C](#).

States with Highest Fatality Rate on Rural Non-Interstate Roads, and Fatality Rate on all Other Roads (2020)							
1	South Carolina	4.13	0.99	14	Mississippi	2.45	1.40
2	Oregon	3.12	1.00	15	Virginia	2.32	0.74
3	Arizona	2.78	1.42	16	Nevada	2.30	1.11
4	Georgia	2.74	1.13	17	Kansas	2.29	1.08
5	Louisiana	2.72	1.36	18	Delaware	2.28	1.11
6	Tennessee	2.64	1.30	19	Indiana	2.23	0.77
7	California	2.62	1.08	20	Alabama	2.19	0.99
8	Montana	2.58	0.96	21	Oklahoma	2.16	1.19
9	Kentucky	2.56	1.15	22	Pennsylvania	2.02	1.04
10	West Virginia	2.54	1.09	23	South Dakota	2.01	0.93
11	North Carolina	2.52	1.01	24	Illinois	2.01	1.13
12	Florida	2.51	1.48	25	Colorado	1.99	1.08
13	Texas	2.48	1.23	U.S. TOTAL		2.17	1.09

The higher traffic fatality rate found on rural, non-Interstate routes results from 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 58 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 non-freeway collector and arterial roads have lane widths of 10 feet or less, compared to 19 percent of urban non-freeway collector and arterial roads.
- Most head-on crashes on rural, non-Interstate roads are 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.

Enhancing rural roadway safety will require the implementation of a comprehensive approach that improves roadway safety features, driver behavior, vehicle safety and post-crash care. Needed roadway safety 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.

- A 2017 [report](#) from the [AAA Foundation for Traffic Safety](#) found that implementing the \$146 billion in needed, cost-effective 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. Thus, over a 20-year period, every \$100 million spent on needed roadway safety improvements would reduce the number of traffic fatalities by 44 and serious traffic injuries by 760.
- In early 2022 the U.S. Department of Transportation adopted a comprehensive [National Roadway Safety Strategy](#), a roadmap for addressing the nation's roadway safety crisis based on a [Safe System](#) approach. The Safe System approach, which is also being adopted by state and local transportation agencies has five objectives: [Safer People](#), [Safer Roads](#), [Safer Vehicles](#), [Safer Speeds](#), and improved [Post-Crash Care](#).
- 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, upgrading or adding guardrails, and improving pedestrian and bicycling facilities.
- **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 only by targeting individual safety problem points on a road, but also by making entire segments safer through improving roadway segments that exhibit 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.

Twelve percent of the nation's rural roads have pavements in poor condition, and nearly one-in-twelve of the nation's rural bridges need rehabilitation, repair or replacement.

- In 2020, 12 percent of the nation's major rural roads (arterials and collectors) were rated in poor condition, 19 percent were rated in mediocre condition, 17 percent were rated in fair condition and 51 percent were rated in good condition.
- The chart below ranks the 25 states with the greatest percentage of rural roads in poor condition in 2020. Rural pavement conditions for all states can be found in [Appendix D](#).

States with Highest Share of Rural Pavements in Poor Condition					
1	Arkansas	33%	14	Wisconsin	17%
2	Rhode Island	32%	15	Louisiana	15%
3	New Mexico	32%	16	Colorado	15%
4	West Virginia	31%	17	Michigan	13%
5	Hawaii	30%	18	New Hampshire	13%
6	Mississippi	24%	19	Indiana	13%
7	Connecticut	22%	20	Massachusetts	12%
8	Washington	22%	21	Arizona	12%
9	Missouri	20%	22	Texas	12%
10	Maine	20%	23	California	12%
11	Alaska	19%	24	South Dakota	11%
12	Vermont	19%	25	Utah	11%
13	Pennsylvania	18%	U.S. Average		12%

- In 2022, eight percent of the nation's rural bridges were rated as poor/structurally deficient. Forty-eight percent of rural bridges were rated fair and 44 percent of rural bridges were rated in good condition.
- Of the nation's 618,253 bridges, 70 percent (435,189 bridges) are rural. Of the nation's 42,639 bridges that are rated poor/structurally deficient, 80 percent (34,026 bridges) are rural.
- 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 2022. Rural bridge conditions for all states can be found in [Appendix E](#).

States with Highest Share of Rural Bridges in Poor/Structurally Deficient Condition					
1	Iowa	21%	14	Illinois	9%
2	West Virginia	20%	15	New Jersey	8%
3	South Dakota	18%	16	Nebraska	8%
4	Pennsylvania	15%	17	North Carolina	8%
5	Rhode Island	15%	18	Alaska	8%
6	Maine	15%	19	New Hampshire	8%
7	Louisiana	14%	20	California	7%
8	Michigan	12%	21	Kentucky	7%
9	North Dakota	11%	22	Montana	7%
10	New York	10%	23	Massachusetts	7%
11	Oklahoma	10%	24	Wisconsin	7%
12	Missouri	10%	25	Mississippi	7%
13	Hawaii	9%	U.S. Average		8%

RURAL TRANSPORTATION CHALLENGE: CONNECTIVITY

The potential for 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 and extraction sectors, 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 doubled, from 165 million to 333 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 QUALITY OF LIFE AND ECONOMIC VITALITY RELY ON TRANSPORTATION

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. 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.

- The importance of the rural transportation system as the backbone of the nation's energy, food and fiber supply chain was heightened during the COVID-19 pandemic.
- Freight mobility and efficiency is fundamental to rural economic vitality and prosperity. Economic growth and stability in rural areas are heavily reliant on the ability to move raw materials into, or the value-added products out of, these areas.
- The average annual U.S. rural household's vehicle miles of travel is approximately 50 percent higher than the average urban household.
- 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 \$1.2 trillion to the U.S. gross domestic product (GDP) in 2021. This represents 5.3 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."
- The [Council of State Governments](#) (CSG) 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 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 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 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 419 national parks, which are largely located in rural areas, received 297 million visitors in 2021, many in personal vehicles.
- In 2021, domestic and international travelers in the U.S. spent approximately \$910 billion.
- Travel and tourism spending in the U.S. in 2021 supported 6.7 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 15 billion gallons in 2021.
- U.S. production of liquid fuels, including crude oil and natural gas, increased 90 percent from 2000 to 2021, increasing liquid fuel's share of overall U.S. energy production (including coal and nuclear) from 49 to 67 percent.

- U.S. production of renewable energy, including wind and solar, increased 102 percent from 2000 to 2021, increasing renewable energy's share of overall U.S. energy production from nine to 13 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 annual travel per-lane-mile by large trucks on rural Interstate highways in the U.S. increased 31 percent from 2000 to 2020.

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. The following recommendations for an improved rural transportation system are 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.
- ✓ A [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 ensure 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.

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), the General Accountability Office (GAO) and the U.S. Census Bureau. Cover photo image: Shutterstock.

INTRODUCTION

America'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. The nation's reliance on its freight transportation system in keeping urban and rural communities adequately supplied with medical supplies, food and energy was heightened during the COVID-19 pandemic. 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 economic growth 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.

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 education, and to provide links to other social services. Transportation supports businesses and is a critical factor in a company's decisions regarding where 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

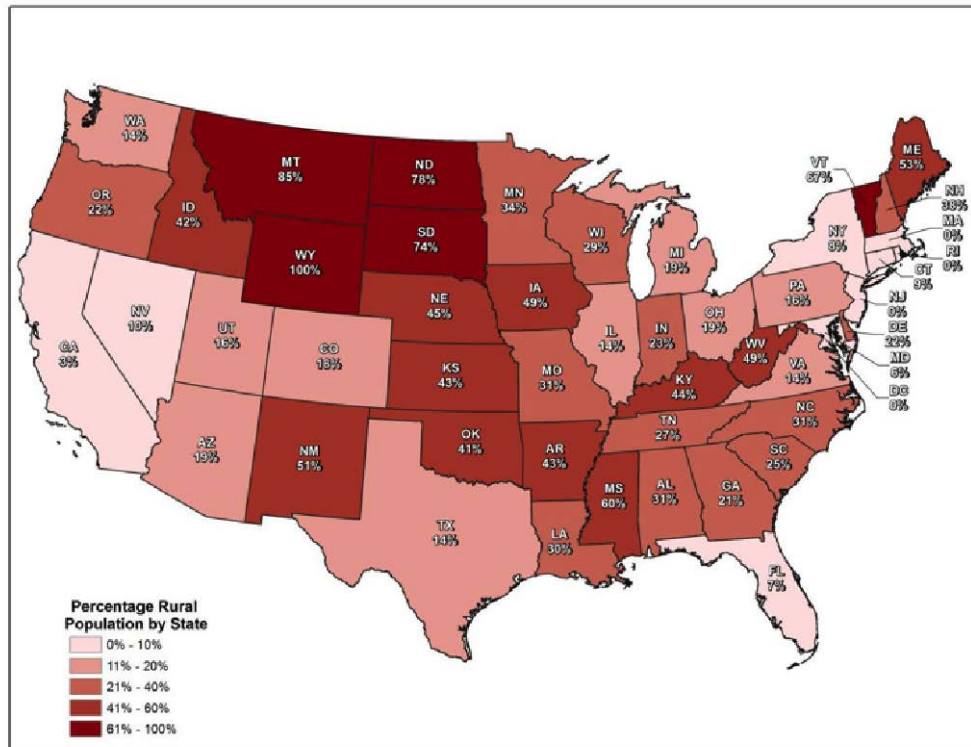
The U.S. Census Bureau defines rural areas as regions outside of urban areas with a population of 2,500 or more.¹ According to the U.S. Census Bureau definition, approximately 60 million people - 18 percent of the nation's population- live in rural areas.² Rural areas cover 97 percent of the nation's land area and are home to the vast majority of the nation's 2 million farms.³

The nation's rural communities are more reliant on their transportation system than their urban counterparts. The average annual U.S. rural household's vehicle miles of travel (VMT) is approximately 50 percent higher than the average urban household.⁴

America's rural population declined by less than one percent (0.6) from 2010 to 2020), with the losses largely occurring in counties experiencing persistent poverty.⁵

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.

America's rural population is older than the nation as a whole, with an average age of residents in rural areas of 49 years, compared to 46 in urban areas.⁶

Growth in rural areas, particularly in the South and West has, in part, 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.⁷ A continued movement of retiring baby boomers to rural America is considered likely as aging Americans seek out communities that have these qualities.⁸

TRANSPORTATION'S CRITICAL IMPORTANCE TO THE RURAL ECONOMY

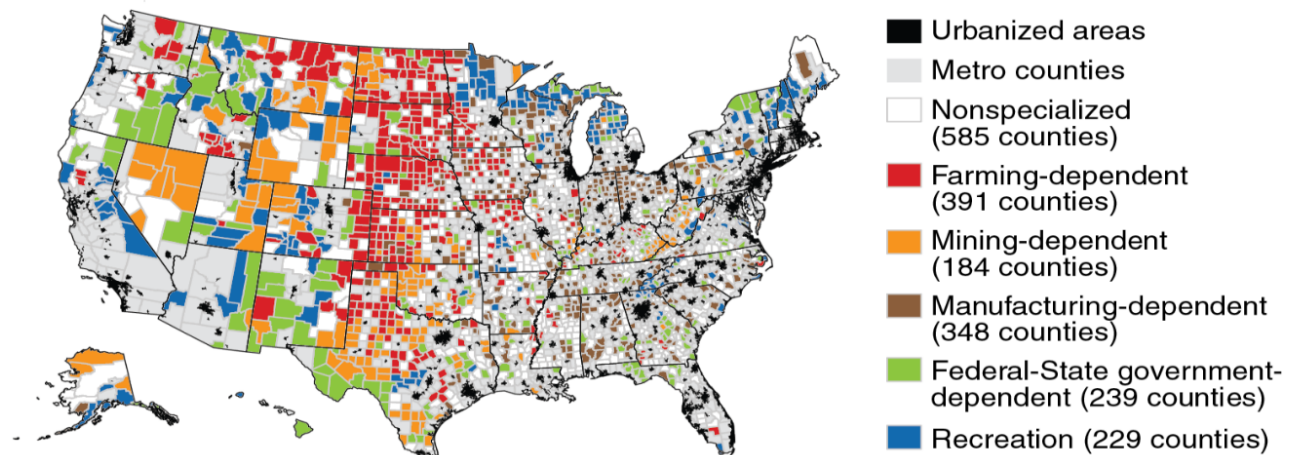
The quality of life in America's small communities and rural areas and the health of the nation's rural economy, from the production and transport of energy, food and fiber, to attracting tourism, is highly reliant on the quality of the nation's transportation system.

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.⁹ Similarly, manufacturing jobs account for 15 percent of earnings in the nation's rural economy versus nine percent in the urban economy.¹⁰

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 2. Rural Counties Classified by Dominant Economic Sector

Rural counties vary in their economic structure with marked regional differences



Note: The 2015 county typologies use data from 2010-2012. See footnote 1.

Source: USDA, Economic Research Service using data from the Bureau of Economic Analysis.

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.”¹¹

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.¹²

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 \$1.2 trillion to the U.S. gross domestic product (GDP) in 2021 – 5.3 percent of overall U.S. GDP.¹³

A report from [The Council of State Governments](#) (CSG) 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.”¹⁴

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.¹⁵ 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.¹⁶

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.”¹⁷

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 scenic parks and recreational areas, which are mostly located in rural areas. In 2021, domestic and international travelers in the U.S. spent approximately \$910 billion.¹⁸ Travel and tourism spending in the U.S. in 2021 supported 6.7 million jobs.¹⁹ America’s 419 national parks, which are largely located in rural areas, received 297 million visitors in 2021, many in personal vehicles.²⁰

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.

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 15 billion gallons in 2021.²¹ U.S. production of liquid fuels, including crude oil and natural gas, increased 90 percent from 2000 to 2021, increasing liquid fuel’s share of overall U.S. energy production from 49 to 67 percent.²²

U.S. production of renewable energy, including wind and solar, increased 102 percent from 2000 to 2021, increasing renewable energy’s share of overall U.S. energy production from nine to 13 percent.²³

The development of 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. Annual travel per-lane mile by large trucks on U.S. rural Interstate highways increased 31 percent from 2000 to 2020.²⁴

RURAL TRANSPORTATION CHALLENGES: FUNDING

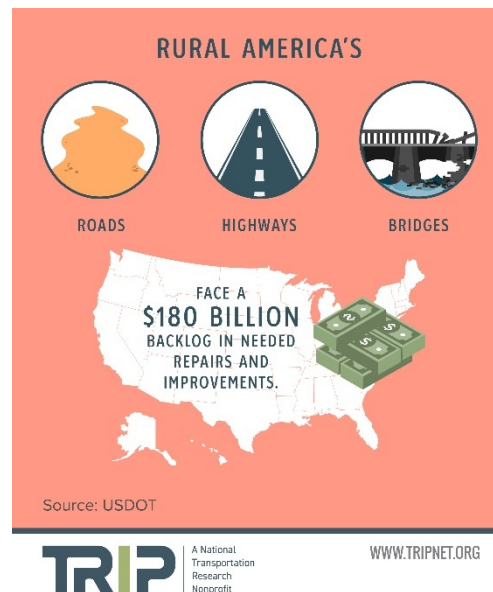
Federal funds for highway and transit improvements are provided through the federal Highway Trust Fund, which raises revenue through federal user fees, largely an 18.4 cents-per-gallon tax on gasoline and a 24.4 cents-per-gallon tax on diesel fuel.

Signed into law in November 2021, the bipartisan [Infrastructure Investment and Jobs Act](#) (IIJA) will provide a significant boost in federal investment in roads, bridges and transit and offers an opportunity

for the nation to make progress in improving the safety, reliability and condition of America's transportation system. The IIJA will provide \$454 billion over the five-year period from 2022 to 2026 for investment in highways and transit, resulting in a 38 percent increase in federal investment in 2022.²⁵ The IIJA includes a \$2 billion [Rural Surface Transportation Grant Program](#) that will support projects to improve and expand the surface transportation infrastructure in rural areas to increase connectivity, improve the safety and reliability of the movement of people and freight, and generate regional economic growth and improve quality of life.

An analysis of the [Status of the Nation's Highways, Bridges and Transit Conditions and Performance Report, 24rd Edition](#) report, submitted by the USDOT to Congress in 2021, indicates that the U.S. faces a \$180 billion backlog in needed repairs and improvements to the nation's rural roads, highways and bridges.²⁶ This includes a \$109 billion backlog for rural road and highway rehabilitation, a \$35 billion backlog for needed rural bridge rehabilitation, and a \$36 billion backlog for needed rural roadway enhancements.²⁷

The findings of the [report](#) indicate that the nation's annual \$21 billion investment in rural road, highway and bridge rehabilitation and enhancements by all levels of government should be increased by 38 percent, to approximately \$29 billion annually, to improve their condition, reliability and safety.²⁸



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 deficiencies common on many rural roads.

In 2020, traffic crashes claimed the lives of 38,824 people in the U.S. Traffic crashes on the nation's non-Interstate rural roads resulted in 14,582 fatalities in 2020 -- 38 percent of all traffic fatalities in the U.S. The nation's non-Interstate rural roads carried only 23 percent of all vehicle miles of travel (VMT) in 2020.²⁹

The fatality rate on rural non-Interstate routes in 2020 was 2.17 deaths for every 100 million VMT, approximately double the fatality rate of 1.09 fatalities per 100 million VMT on all other routes.³⁰ The overall fatality rate for all U.S. roads in 2020 was 1.34 fatalities per 100 million VMT.³¹

The five states with the largest number of fatalities as a result of crashes on rural, non-Interstate roads in 2020 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 2020 and their share of overall fatalities and VMT can be found in [Appendix B](#).

Chart 3. States with highest number of fatalities in crashes on non-Interstate rural roads in 2020.

States with Highest Number of Rural Non-Interstate Traffic Fatalities (2020)					
1	Texas	1,334	14	Tennessee	438
2	California	1,035	15	Virginia	425
3	North Carolina	779	16	Michigan	403
4	South Carolina	699	17	Wisconsin	358
5	Florida	629	18	Oklahoma	342
6	Georgia	594	19	Louisiana	341
7	Alabama	474	20	Illinois	305
8	Indiana	467	21	New York	273
9	Mississippi	458	22	Oregon	272
10	Missouri	457	23	Arizona	250
11	Kentucky	446	24	Kansas	238
12	Pennsylvania	442	25	Minnesota	226
13	Ohio	440	U.S. Total		14,582

Source: TRIP analysis of NHTSA and FHWA data.

The state with the highest rate of traffic fatalities on its non-Interstate, rural routes in 2020 was South Carolina, with 4.13 traffic fatalities per 100 million VMT.³² Oregon, Arizona, Georgia and Louisiana 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 4. States with highest rate of traffic fatalities on rural, non-Interstate routes per 100 million VMT and fatality rate on all other roads in the state in 2020.

States with Highest Fatality Rate on Rural Non-Interstate Roads, and Fatality Rate on all Other Roads (2020)							
1	South Carolina	4.13	0.99	14	Mississippi	2.45	1.40
2	Oregon	3.12	1.00	15	Virginia	2.32	0.74
3	Arizona	2.78	1.42	16	Nevada	2.30	1.11
4	Georgia	2.74	1.13	17	Kansas	2.29	1.08
5	Louisiana	2.72	1.36	18	Delaware	2.28	1.11
6	Tennessee	2.64	1.30	19	Indiana	2.23	0.77
7	California	2.62	1.08	20	Alabama	2.19	0.99
8	Montana	2.58	0.96	21	Oklahoma	2.16	1.19
9	Kentucky	2.56	1.15	22	Pennsylvania	2.02	1.04
10	West Virginia	2.54	1.09	23	South Dakota	2.01	0.93
11	North Carolina	2.52	1.01	24	Illinois	2.01	1.13
12	Florida	2.51	1.48	25	Colorado	1.99	1.08
13	Texas	2.48	1.23	U.S. TOTAL		2.17	1.09

Source: TRIP analysis of NHTSA and FHWA 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.³³ 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 58 percent of urban, major non-freeway roads and highways are two-lane routes.³⁴

Rural routes have often been constructed over a period of years. As a result, they may have inconsistent design features for such things as lane widths, curves, shoulders and clearance zones along roadways.³⁵ Many rural roads have been built with narrow lanes, limited shoulders, excessive curves and steep slopes alongside roadways.³⁶

While a desirable lane width for collector and arterial roadways is at least 11 feet, 23 percent of rural non-freeway collector and arterial roads have lane widths of 10 feet or less, compared to 19 percent of urban non-freeway collector and arterial roads.³⁷ 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.³⁸ 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.”³⁹

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.⁴⁰

A 2017 [report](#) from the [AAA Foundation for Traffic Safety](#) found that implementing cost-effective and needed roadway safety improvements on U.S. roadways at a cost of \$146 billion 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. Thus, over a 20-year period, every \$100 million spent on needed roadway safety improvements would reduce the number of traffic fatalities by 44 and serious traffic injuries by 760.

Enhancing rural roadway safety will require the implementation of a comprehensive approach that improves roadway safety features, driver behavior, vehicle safety and post-crash care.

In early 2022 the U.S. Department of Transportation adopted a comprehensive [National Roadway Safety Strategy](#), a roadmap for addressing the nation's roadway safety crisis based on a [Safe System](#) approach that acknowledges the following: humans make mistakes and are physically

vulnerable; traffic deaths and serious injuries are unacceptable; traffic deaths and serious injuries need to be reduced by the provision of a redundant transportation system that reduces or minimizes crashes and ensures that, if crashes do occur, they do not result in serious injury or death.⁴¹

Chart 5. The Safe System Approach.



Source: US Department of Transportation.

The Safe System approach, which is also being adopted by state and local transportation agencies has five objectives:

- [Safer People](#): Encourage safe, responsible behavior by people who use our roads, and create conditions that prioritize their ability to reach their destination unharmed.
- [Safer Roads](#): Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.
- [Safer Vehicles](#): Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and non-occupants.
- [Safer Speeds](#): Promote safer speeds in all roadway environments through a combination of thoughtful, context-appropriate roadway design, targeted education and outreach campaigns, and enforcement.
- [Post-Crash Care](#): Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.

Improving safety on the nation's roadways will require that additional steps are taken to make further progress in achieving the Safe System's objectives. The National Highway Traffic Safety Administration, which provides states with roadway safety grants, requires states to submit an annual

[state highway safety plan](#). The state plans outline numerous steps states are taking to improve traffic safety. Elements of these state roadway safety plans aimed at addressing the Safe System objectives include:

- [Safer People](#): education on speeding, impaired or disadvantaged driving; education on safe pedestrian and bicycling behavior; education on driving safely around large commercial vehicles; enforcement of commercial driver license and vehicle weight requirements; extension of safety belt laws and their enforcement to include all passenger vehicle occupants; enhancing enforcement action of speeding, impaired, aggressive and distracted driving, particularly at high-risk locations; increase penalties, particularly for repeat offender drivers; and increased enforcement at work zones.
- [Safer Roads](#): converting intersections to roundabouts; removing or shielding roadside objects; the addition of left-turn lanes at intersections; improved signalization and lighting at intersections; adding or improving median barriers; improved roadway lighting; adding centerline or shoulder rumble strips; improving pedestrian and bicycle facilities, including sidewalks and bike lanes and providing pedestrian crossing islands; improved work zone safety measures; wider lanes and paved shoulders; upgrading roads from two lanes to four lanes; providing or improving lane markings; updating rail crossings; eliminating vertical pavement drop-offs; and providing large truck parking spaces.
- [Safer Vehicles](#): Support the development, testing and deployment of connected and autonomous vehicle technology such as collision avoidance, lane departure avoidance systems and turning detection systems.
- [Safer Speeds](#): Where appropriate, provide roadway features to encourage safer speeds, including traffic roundabouts and curb extensions; improved signage and dynamic speed signing at high-risk locations; education on the consequences of speeding; and increased speeding enforcement, particularly at high-risk locations.
- [Post-Crash Care](#): Reduce crash response time including the use of emergency vehicle preemption technology; improve emergency response to multi-vehicle or hazardous material crashes; and increase access to level one or two trauma centers for seriously-injured crash victims.

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.⁴²

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 markings 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.⁴³

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.⁴⁴

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.⁴⁵

MODERATE COST:

Install median barriers – Median barriers have been found to reduce traffic fatality rates by 65 percent.⁴⁶

Adding turn lanes at intersections – The addition of left turn lanes at rural intersections was found to reduce crashes by 33 to 48 percent.⁴⁷ The addition of right turn lanes at intersections was found to reduce crashes by eight to 26 percent.⁴⁸

Resurfacing pavements – Resurfaced pavements have been found to result in a 25 percent reduction in fatal crashes.⁴⁹

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.⁵⁰

Improved roadway alignment – Realigning roadways has been found to average a 50 percent reduction in traffic fatality rates.⁵¹

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.⁵²

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.⁵³

Widen lanes – Making lanes wider has been found to reduce traffic fatality rates by eight to 10 percent.⁵⁴

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.⁵⁵

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 2020, 12 percent of the nation's major rural roads were rated in poor condition, 19 percent were rated in mediocre condition, 17 percent were rated in fair condition and 51 percent were rated in good condition.⁵⁶ 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. 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.⁵⁷

The states with the largest share of their rural roads with pavements in poor condition are Arkansas, Rhode Island, 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.

States with Highest Share of Rural Pavements in Poor Condition					
1	Arkansas	33%	14	Wisconsin	17%
2	Rhode Island	32%	15	Louisiana	15%
3	New Mexico	32%	16	Colorado	15%
4	West Virginia	31%	17	Michigan	13%
5	Hawaii	30%	18	New Hampshire	13%
6	Mississippi	24%	19	Indiana	13%
7	Connecticut	22%	20	Massachusetts	12%
8	Washington	22%	21	Arizona	12%
9	Missouri	20%	22	Texas	12%
10	Maine	20%	23	California	12%
11	Alaska	19%	24	South Dakota	11%
12	Vermont	19%	25	Utah	11%
13	Pennsylvania	18%	U.S. Average		12%

Source: TRIP analysis of Federal Highway Administration Data.

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.⁵⁸

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 2022, eight percent of the nation's rural bridges were rated as poor/structurally deficient, 48 percent were rated fair, and the remaining 44 percent were rated in good condition.⁵⁹ Of the nation's 618,253 bridges, 70 percent (435,189 bridges) are rural.⁶⁰ Of the nation's 42,639 bridges that are rated poor/structurally deficient, 80 percent (34,026 bridges) are rural.⁶¹

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 – 21 percent – rated poor/structurally deficient, Iowa has the highest share of poor/structurally deficient bridges in the nation, followed by West Virginia, South Dakota, Pennsylvania and Rhode Island.⁶² 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 (2022).

States with Highest Share of Rural Bridges in Poor/Structurally Deficient Condition					
1	Iowa	21%	14	Illinois	9%
2	West Virginia	20%	15	New Jersey	8%
3	South Dakota	18%	16	Nebraska	8%
4	Pennsylvania	15%	17	North Carolina	8%
5	Rhode Island	15%	18	Alaska	8%
6	Maine	15%	19	New Hampshire	8%
7	Louisiana	14%	20	California	7%
8	Michigan	12%	21	Kentucky	7%
9	North Dakota	11%	22	Montana	7%
10	New York	10%	23	Massachusetts	7%
11	Oklahoma	10%	24	Wisconsin	7%
12	Missouri	10%	25	Mississippi	7%
13	Hawaii	9%	U.S. Average		8%

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 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 and fire response, or emergency medical services.⁶³

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 doubled, from 165 million to 333 million, and is projected to increase to 420 million people by 2050.⁶⁴

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](#)).⁶⁵ 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.⁶⁶

The AASHTO report 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.⁶⁷ 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.⁶⁸ 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.⁶⁹ 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.⁷⁰

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 for an improved rural transportation system are 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 ensure 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

The nation's rural roads and bridges are a critical link in the nation's transportation system, providing access to food, fiber and manufactured goods that are keeping Americans moving while continuing to drive the nation's economic recovery. In a rural America 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 supports rural America's economy and will support its 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.

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