New York Transportation by the Numbers

MEETING THE STATE'S NEED FOR SAFE, SMOOTH AND EFFICIENT MOBILITY

DECEMBER 2020

TRIP | A National Transportation Research Nonprofit

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.

NEW YORK KEY TRANSPORTATION FACTS

THE HIDDEN COSTS OF DEFICIENT ROADS

Driving on New York roads that are deteriorated, congested and that lack some desirable safety features costs New York drivers a total of $26 billion each year. TRIP has calculated the cost to the average motorist in the state's largest urban areas in the form of additional vehicle operating costs (VOC) as a result of driving on rough roads, the cost of lost time and wasted fuel due to congestion, and the financial cost of traffic crashes in which the lack of adequate safety features was a contributing factor. The chart below details the cost of deficient roads statewide and for the average driver in the state's largest urban areas and statewide.

Location	VOC	Safety	Congestion	TOTAL
Albany-Schenectady-Troy	$519	$913	$736	$2,168
Binghamton	$555	$480	$348	$1,383
Buffalo - Niagara Falls	$431	$369	$965	$1,765
New York -Newark-Jersey City	$722	$290	$1,947	$2,959
Poughkeepsie-Newburgh-Middletown	$419	$553	$608	$1,580
Rochester	$353	$504	$769	$1,626
Syracuse	$443	$563	$378	$1,384
Utica	$391	$520	$353	$1,264
New York Statewide	**$7.2 Billion**	**$4.6 Billion**	**$14.2 Billion**	**$26 Billion**

NEW YORK ROADS PROVIDE A ROUGH RIDE

Due to inadequate state and local funding, 47 percent of major locally and state-maintained roads and highways in New York are in poor or mediocre condition. Driving on rough roads costs the average New York driver $588 annually in additional vehicle operating costs – a total of $7.2 billion statewide. The chart below details pavement conditions on major roads in the state's largest urban areas and statewide.

Location	Poor	Mediocre	Fair	Good
Albany-Schenectady-Troy	22%	24%	21%	33%
Binghamton	33%	15%	16%	35%
Buffalo - Niagara Falls	17%	21%	21%	42%
New York -Newark-Jersey City	45%	23%	10%	21%
Poughkeepsie-Newburgh-Middletown	18%	23%	21%	38%
Rochester	12%	19%	22%	48%
Syracuse	18%	23%	16%	44%
Utica	12%	28%	17%	43%
New York Statewide	**25%**	**22%**	**16%**	**37%**

NEW YORK BRIDGE CONDITIONS

Ten percent of New York's bridges are rated in poor/structurally deficient condition, the eleventh highest share in the nation. Bridges that are rated poor/structurally deficient have significant deterioration of the bridge deck, supports or other major components. Fifty-four percent of the state's bridges are rated in fair condition and the remaining 36 percent are in good condition. The chart below details bridge conditions statewide and in the state's largest urban areas.

Location	POOR/STRUCTURALLY DEFICIENT		FAIR		GOOD		TOTAL BRIDGES
	Number	Share	Number	Share	Number	Share	
Albany-Schenectady-Troy	72	9%	474	57%	290	35%	836
Binghamton	39	6%	368	54%	273	40%	680
Buffalo - Niagara Falls	98	8%	532	46%	530	46%	1,160
New York -Newark-Jersey City	462	7%	4,371	66%	1,770	27%	6,603
Poughkeepsie-Newburgh-Middletown	116	14%	511	63%	182	22%	809
Rochester	104	8%	617	50%	515	42%	1,236
Syracuse	98	11%	529	60%	249	28%	876
Utica	57	12%	234	48%	195	40%	486
NEW YORK STATEWIDE	**1,745**	**10%**	**9,447**	**54%**	**6,348**	**36%**	**17,540**

NEW YORK VEHICLE TRAVEL AND CONGESTION INCREASING

In 2018, the state's transportation system carried 123.5 billion annual vehicle miles of travel (VMT). Congested roads choke commuting and commerce and cost New York drivers $14.2 billion each year in the form of lost time and wasted fuel. In the most congested urban areas, drivers lose up to $1,947 and as many as 92 hours per year sitting in congestion. Due to the Covid-19 pandemic, vehicle travel in New York dropped by as much as 45 percent in April 2020 (as compared to vehicle travel during the same month the previous year), but rebounded to 10 percent below the previous year's volume in September 2020. The chart below shows the annual number of hours and gallons of fuel lost to congestion per driver and the average cost per driver of lost time and wasted fuel due to congestion in the state's largest urban areas.

Location	Hours Lost to Congestion	Annual Cost Per Driver	Gallons of Fuel Wasted Due to Congestion	Gallons of Fuel Wasted Per Driver
Albany-Schenectady-Troy	49	$736	7,341,000	21
Binghamton	16	$348	1,231,000	7
Buffalo - Niagara Falls	48	$965	14,094,000	23
New York -Newark-Jersey City	92	$1,947	323,712,000	38
Poughkeepsie-Newburgh-Middletown	37	$608	3,908,000	19
Rochester	40	$769	8,574,000	20
Syracuse	18	$378	3,437,000	8
Utica	17	$353	871,000	7
	New York Statewide		**264,586,094**	**N/A**

NEW YORK TRAFFIC SAFETY AND FATALITIES

A total of 5,127 people were killed in traffic crashes in New York from 2014-2018. In 2018, New York had 0.76 traffic fatalities for every 100 million miles traveled, lower than the national average of 1.13. The fatality rate on New York's non-interstate rural roads is more than four-and-a-half times higher than on all other roads in the state (2.24 fatalities per 100 million vehicle miles of travel vs 0.49).

Traffic crashes imposed a total of $13.8 billion in economic costs in New York in 2018 and traffic crashes in which a lack of adequate roadway safety features were likely a contributing factor imposed $4.6 billion in economic costs. The chart below details the average number of people killed in traffic crashes in the state's largest urban areas between 2014 and 2018, and the cost of traffic crashes per driver.

Location	Average Fatalities 2014-2018	Safety Costs per Driver
Albany-Schenectady-Troy	76	$913
Binghamton	29	$480
Buffalo - Niagara Falls	103	$369
New York -Newark-Jersey City	1,014	$290
Poughkeepsie-Newburgh-Middletown	82	$553
Rochester	128	$504
Syracuse	88	$563
Utica	29	$520

NEW YORK TRANSPORTATION FUNDING

The ability of revenue from New York's motor fuel tax – a critical source of state transportation funds – to keep pace with the state's future transportation needs is likely to erode as a result of increasing vehicle fuel efficiency and the increasing use of electric vehicles. The average fuel efficiency of U.S. passenger vehicles increased from 20 miles per gallon in 2010 to 24.5 miles per gallon in 2020. Average fuel efficiency is expected to increase another 31 percent by 2030, to 32 miles per gallon, and increase 51 percent by 2040, to 37 miles per gallon. The share of electric vehicles of total passenger vehicle sales in the U.S. is expected to increase to five percent by 2023 and to 60 percent by 2040, by which time they will represent approximately 30 percent of the passenger vehicle fleet.

The current federal transportation legislation, Fixing America's Surface Transportation Act (FAST Act), was set to expire on September 30, 2020. Congress extended it by one year to September 30, 2021. The FAST Act is a major source of funding for road, highway and bridge repairs in New York. Throughout the initial five years of the FAST-Act – fiscal years 2016 to 2020 – the program provided $8.9 billion to New York for road repairs and improvements, an average of $1.8 billion per year. From 2014 to 2018, the federal government provided $1.28 for road improvements in New York for every $1.00 state motorists paid in federal highway user fees, including the federal state motor fuel tax.

From 2014 to 2018, federal funds provided for highway improvements were the equivalent of 37 percent of the amount of New York state capital outlays on road, highway and bridge projects, including construction, engineering and right-of-way acquisition.

TRANSPORTATION AND ECONOMIC DEVELOPMENT

The health and future growth of New York's economy is riding on its transportation system. Each year, nearly $1.3 trillion in goods are shipped to and from sites in New York, mostly by truck. Increases in passenger and freight movement will place further burdens on the state's already deteriorated and congested surface transportation system. The value of freight shipped to and from sites in New York, when adjusted for inflation, is expected to increase by 154 percent by 2045, and by 108 percent by 2045 for goods shipped by trucks.

A report by the American Road & Transportation Builders Association found that the design, construction and maintenance of transportation infrastructure in New York supports approximately 319,000 full-time jobs across all sectors of the state economy. These workers earn $9.8 billion annually. Approximately 3.5 million full-time jobs in New York in key industries like tourism, manufacturing, retail sales and agriculture are completely dependent on the state's transportation infrastructure network.

Sources of information for this report include the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the Bureau of Transportation Statistics (BTS), the U.S. Census Bureau, the Texas Transportation Institute (TTI), the American Road & Transportation Builders Association (ARTBA), and the National Highway Traffic Safety Administration (NHTSA). Cover page photo credit: Getty Images.

INTRODUCTION

New York's roads, highways and bridges form vital transportation links for the state's residents, visitors and businesses, providing daily access to homes, jobs, shopping, natural resources and recreation. Modernizing New York's transportation system is critical to quality of life and economic competitiveness in the Empire State. Inadequate transportation investment, which will result in deteriorated transportation facilities and diminished access, will negatively affect New York's economic competitiveness and quality of life.

The necessity of a reliable transportation system in New York has been reinforced during the coronavirus pandemic, which has placed increased importance on the ability of a region's transportation network to support a reliable supply chain.

To foster growth, maintain its level of economic competitiveness and achieve further economic growth, New York will need to maintain and modernize its roads, highways and bridges by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient, reliable and safe mobility for residents, visitors and businesses. Making needed improvements to New York's roads, highways, bridges and transit systems could also provide a significant boost to the state's economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.

This report examines the condition, use and safety of New York's roads, highways and bridges, and the state's future mobility needs. Sources of information for this report include the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the Bureau of Transportation Statistics (BTS), the U.S. Census Bureau, the Texas Transportation Institute (TTI), the American Road & Transportation Builders Association (ARTBA), and the National Highway Traffic Safety Administration (NHTSA).

In addition to statewide data, the TRIP report includes regional data for the Albany-Schenectady-Troy, Binghamton, Buffalo-Niagara Falls, New York-Newark-Jersey City, Poughkeepsie-Newburgh-Middletown, Rochester, Syracuse and Utica urban areas. An urban area is defined as a region's municipalities and surrounding suburbs for pavement condition and congestion data; bridge and traffic fatality data include a region's major counties.[1]

POPULATION, TRAVEL AND ECONOMIC TRENDS IN NEW YORK

New York motorists and businesses require a high level of personal and commercial mobility. To foster quality of life and spur continued economic growth, it is critical that the state provide a safe

and modern transportation system that can accommodate future growth in population, tourism, business, recreation and vehicle travel.

New York's population was approximately 19.5 million residents in 2019.[2] New York had approximately 12.2 million licensed drivers in 2018.[3] From 2000 to 2019, New York's gross domestic product (GDP), a measure of the state's economic output, increased by 34 percent, when adjusted for inflation.[4] U.S. GDP increased 45 percent during the same period.[5] In 2018, the state's transportation system carried 123.5 billion annual vehicle miles of travel (VMT).[6] Due to the Covid-19 pandemic, vehicle travel in New York dropped by as much as 45 percent in April 2020 (as compared to vehicle travel during the same month the previous year), but rebounded to 10 percent below the previous year's volume in September 2020.[7]

CONDITION OF NEW YORK ROADS

The life cycle of New York's roads is greatly affected by the state and local governments' ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible.

The pavement data in this report, which is for all arterial and collector roads and highways, is provided by the Federal Highway Administration (FHWA), based on data submitted annually by the New York Department of Transportation on the condition of major state and locally maintained roads and highways. Pavement data for Interstate highways and other principal arterials is collected for all system mileage, whereas pavement data for minor arterial and all collector roads and highways is based on sampling portions of roadways as prescribed by FHWA to insure the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.

Statewide, 47 percent of New York's major roads are in poor or mediocre condition. Twenty-five percent of New York's major locally and state-maintained roads are in poor condition and 22 percent are in mediocre condition.[8] Sixteen percent of New York's major roads are in fair condition and the remaining 37 percent are in good condition.[9]

Pavements in poor condition provide a noticeable reduction in ride quality and often have visible signs of deterioration including potholes, cracking or rutting, and frequently have deterioration in the pavement's subbase, which will often require costly reconstruction to address. Pavements in mediocre condition provide intermittent reductions in ride quality and often show signs of pavement deterioration, yet may still be able to avoid the need for reconstruction with immediate preservation work. Roads in fair condition may have some intermittent reduction in ride quality and signs of

deterioration, and can be improved with cost-effective roadway preservation treatments. Roads in good condition provide a smooth ride and can be maintained in good condition with ongoing pavement preservation treatments.

Thirty-nine percent of New York's major locally and state-maintained urban roads and highways have pavements rated in poor condition and 25 percent are in mediocre condition.[10] Fourteen percent of New York's major urban roads are rated in fair condition and the remaining 22 percent are rated in good condition.[11]

Ten percent of New York's major locally and state-maintained rural roads and highways have pavements rated in poor condition and 18 percent are in mediocre condition.[12] Eighteen percent of New York's major rural roads are rated in fair condition and the remaining 54 percent are rated in good condition.[13] The chart below details pavement conditions on major urban roads in the state's largest urban areas and statewide.[14]

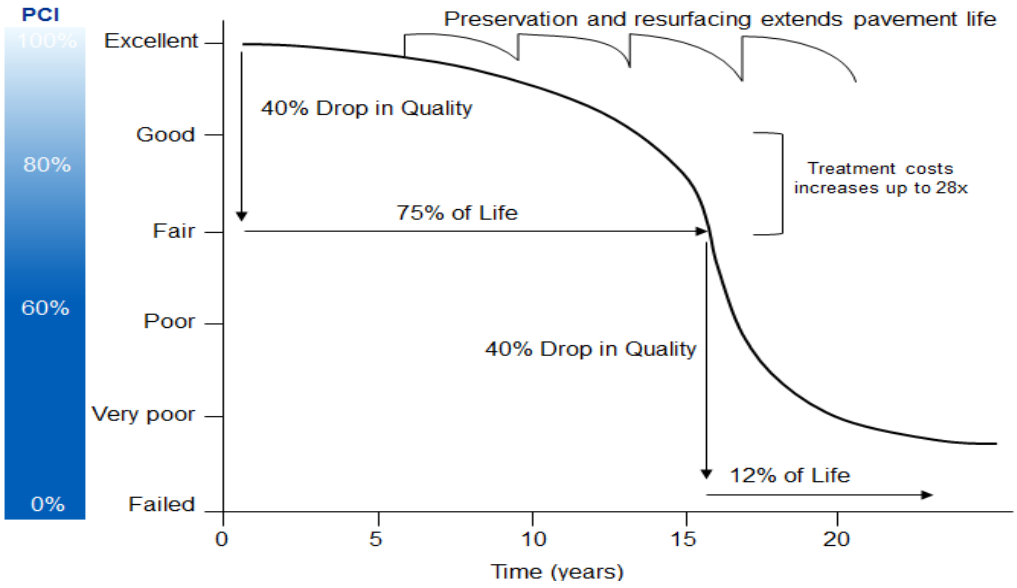
Chart 1. Pavement conditions on major roads in New York's largest urban areas and statewide.

Location	Poor	Mediocre	Fair	Good
Albany-Schenectady-Troy	22%	24%	21%	33%
Binghamton	33%	15%	16%	35%
Buffalo - Niagara Falls	17%	21%	21%	42%
New York -Newark-Jersey City	45%	23%	10%	21%
Poughkeepsie-Newburgh-Middletown	18%	23%	21%	38%
Rochester	12%	19%	22%	48%
Syracuse	18%	23%	16%	44%
Utica	12%	28%	17%	43%
New York Statewide	**25%**	**22%**	**16%**	**37%**

Source: TRIP analysis of Federal Highway Administration data.

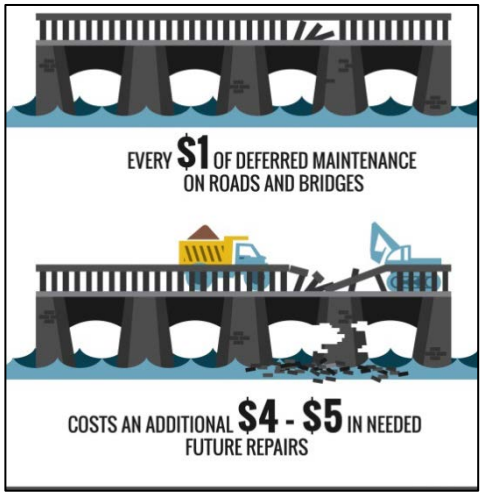
Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are more prone to deterioration because the slow-moving or standing loads occurring at these 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.[15] As roads and highways continue to age, they will reach a point of deterioration 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.

Chart 2. Pavement Condition Cycle Time with Treatment and Cost



Source: North Carolina Department of Transportation (2016). 2016 Maintenance Operations and Performance Analysis Report

Long-term repair costs increase significantly when road and bridge maintenance is deferred, as road and bridge deterioration accelerates later in the service life of a transportation facility and requires more costly repairs. A report on maintaining pavements found that every $1 of deferred maintenance on roads and bridges costs an additional $4 to $5 in needed future repairs.[16]



THE COST TO MOTORISTS OF ROADS IN INADEQUATE CONDITION

TRIP has calculated the additional cost to motorists of driving on roads in poor, mediocre or fair condition. When roads are in poor, mediocre or fair condition – which may include potholes, rutting or rough surfaces – the cost to operate and maintain a vehicle increases. These additional vehicle operating costs (VOC) include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional VOC borne by New York motorists as a result of deteriorated road conditions is $7.2 billion annually, an average of $588 per driver statewide.[17] The chart below details additional VOC per motorist in the state's largest urban

areas and the total additional fuel consumed as a result of driving on roads in poor, mediocre or fair condition.

Chart 3. Vehicle operating costs per motorist and total gallons of fuel wasted annually as a result of driving on deteriorated roads.

Location	Additonal Vehicle Operating Cost	Gallons of Fuel Wasted Due to Rough Roads	Gallons of Fuel Wasted Per Driver
Albany-Schenectady-Troy	$519	8,948,272	22
Binghamton	$555	3,917,091	25
Buffalo - Niagara Falls	$431	13,234,807	18
New York -Newark-Jersey City	$722	298,968,628	33
Poughkeepsie-Newburgh-Middletown	$419	6,845,958	18
Rochester	$353	9,633,977	15
Syracuse	$443	7,518,780	19
Utica	$391	2,293,115	16
New York Statewide	**$7.2 Billion**	**333,535,287**	**26**

Source: TRIP estimates.

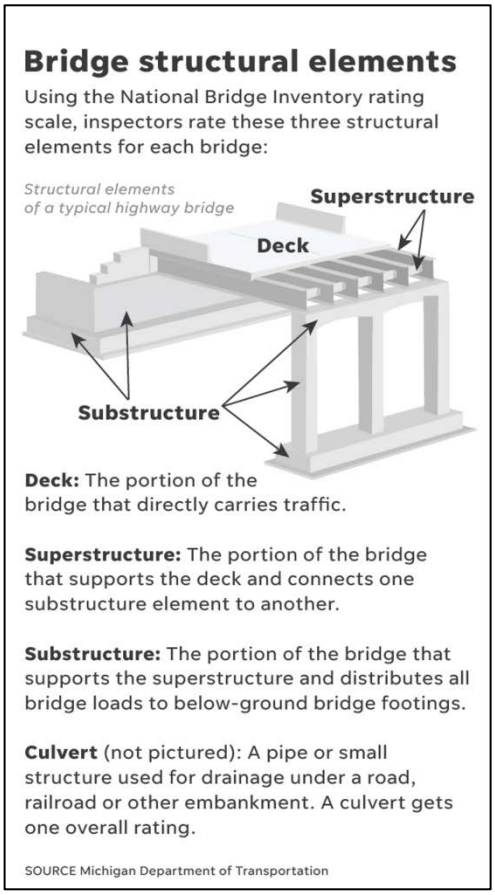
Additional vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.[18] The HDM study found that road deterioration increases ownership, repair, fuel and tire costs. The report found that deteriorated roads accelerate the pace of depreciation of vehicles and the need for repairs because the stress on the vehicle increases in proportion to the level of roughness of the pavement surface. Similarly, tire wear and fuel consumption increase as roads deteriorate since there is less efficient transfer of power to the drive train and additional friction between the road and the tires.

TRIP's additional VOC estimate is based on taking the average number of miles driven annually by a motorist, calculating current VOC based on AAA's driving cost estimates and then using the HDM model to estimate the additional VOC paid by drivers as a result of substandard roads.[19] Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute (TTI) is also factored into TRIP's vehicle operating cost methodology.

BRIDGE CONDITIONS IN NEW YORK

New York's bridges form key links in the state's highway system, providing communities and individuals access to employment, schools, shopping and medical facilities, and facilitating commerce and access for emergency vehicles.

Ten percent (1,745 of 17,540) of New York's locally and state-maintained bridges are rated in poor/structurally deficient condition.[20] This includes all bridges that are 20 feet or more in length. A bridge is deemed poor/structurally deficient if there is significant deterioration of the bridge deck, supports or other major components.



Bridges that are poor/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 also lengthen travel time, waste fuel and reduce the efficiency of the local economy.

Fifty-four percent (9,447 of 17,540) of New York's locally and state-maintained bridges are rated in fair condition.[21] 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 remaining 36 percent (6,348 of 17,540) of the state's bridges are rated in good condition.[22]

The chart below shows the condition of bridges statewide and in New York's largest urban areas.

Chart 4. Bridge conditions statewide and in New York's largest urban areas.

Location	POOR/STRUCTURALLY DEFICIENT		FAIR		GOOD		TOTAL BRIDGES
	Number	Share	Number	Share	Number	Share	
Albany-Schenectady-Troy	72	9%	474	57%	290	35%	836
Binghamton	39	6%	368	54%	273	40%	680
Buffalo - Niagara Falls	98	8%	532	46%	530	46%	1,160
New York -Newark-Jersey City	462	7%	4,371	66%	1,770	27%	6,603
Poughkeepsie-Newburgh-Middletown	116	14%	511	63%	182	22%	809
Rochester	104	8%	617	50%	515	42%	1,236
Syracuse	98	11%	529	60%	249	28%	876
Utica	57	12%	234	48%	195	40%	486
NEW YORK STATEWIDE	**1,745**	**10%**	**9,447**	**54%**	**6,348**	**36%**	**17,540**

Source: TRIP analysis of Federal Highway Administration National Bridge Inventory (2018).

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.

TRAFFIC SAFETY IN NEW YORK

A total of 5,127 people were killed in New York traffic crashes from 2014 to 2018, an average of 1,025 fatalities per year.[23]

Chart 5. Traffic Fatalities in New York 2014 – 2018.

Year	Fatalities
2014	1,039
2015	1,121
2016	1,025
2017	999
2018	943
Average	**1,025**
Total	**5,127**

Source: National Highway Traffic Safety Administration.

Three major factors are associated with fatal vehicle crashes: driver behavior, vehicle characteristics and roadway features. It is estimated that roadway features are likely a contributing factor in approximately one-third of fatal traffic crashes. Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design.

New York's overall traffic fatality rate of 0.76 fatalities per 100 million vehicle miles of travel in 2018 is lower than the national average of 1.13.[24] The fatality rate on New York's non-interstate rural roads is more than four-and-a-half times higher than on all other roads in the state (2.24 fatalities per 100 million vehicle miles of travel vs 0.49).[25] While New York's rural roads account for only 16 percent of vehicle travel in the state, 45 percent of fatalities occur on New York's rural roads.[26]

The chart below details the number of people killed in traffic crashes in the state's largest urban areas between 2014 and 2018, and the cost of traffic crashes per driver.

Chart 6. Average fatalities between 2014 and 2018 and crash cost per driver.

Location	Average Fatalities 2014-2018	Safety Costs per Driver
Albany-Schenectady-Troy	76	$913
Binghamton	29	$480
Buffalo - Niagara Falls	103	$369
New York -Newark-Jersey City	1,014	$290
Poughkeepsie-Newburgh-Middletown	82	$553
Rochester	128	$504
Syracuse	88	$563
Utica	29	$520

Source: TRIP analysis.

Traffic crashes in New York imposed a total of $13.8 billion in economic costs in 2018.[27] TRIP estimates that roadway features were likely a contributing factor in approximately one-third of all fatal traffic crashes, resulting in $4.6 billion in economic costs in New York in 2018.[28] According to a 2015 National Highway Traffic Safety Administration (NHTSA) report, the economic costs of traffic crashes includes work and household productivity losses, property damage, medical costs, rehabilitation costs, legal and court costs, congestion costs and emergency services.[29]

Improving safety on New York's roadways can be achieved through further improvements in vehicle safety; improvements in driver, pedestrian, and bicyclist behavior; and, a variety of improvements in roadway safety features. The severity of serious traffic crashes could be reduced through roadway improvements, where appropriate, such as converting intersections to roundabouts; removing or shielding roadside objects; the addition of left-turn lanes at intersections; the signalization of intersections; adding or improving median barriers; improved lighting; adding centerline or shoulder rumble strips; providing appropriate pedestrian and bicycle facilities, including

sidewalks and bicycle lanes; providing wider lanes, wider and paved shoulders; upgrading roads from two lanes to four lanes; providing better road and lane markings; and updating rail crossings.

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.

TRAFFIC CONGESTION IN NEW YORK

Increasing levels of traffic congestion cause significant delays in New York, particularly in its larger urban areas, choking commuting and commerce. Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to the consumer. Increased levels of congestion can also reduce the attractiveness of a location to a company when considering expansion or where to locate a new facility.

Based on TTI methodology, TRIP estimates the total value of lost time and wasted fuel in New York is approximately $14.2 billion a year. The chart below shows the number of hours lost annually for each driver in the state's largest urban areas, the per-driver cost of lost time and wasted fuel due to congestion, and the total amount of additional fuel consumed annually due to traffic congestion and the average amount of fuel per driver wasted annually due to congestion.

Chart 7. Annual hours and fuel lost to congestion and congestion costs per driver.

Location	Hours Lost to Congestion	Annual Cost Per Driver	Gallons of Fuel Wasted Due to Congestion	Gallons of Fuel Wasted Per Driver
Albany-Schenectady-Troy	49	$736	7,341,000	21
Binghamton	16	$348	1,231,000	7
Buffalo - Niagara Falls	48	$965	14,094,000	23
New York -Newark-Jersey City	92	$1,947	323,712,000	38
Poughkeepsie-Newburgh-Middletown	37	$608	3,908,000	19
Rochester	40	$769	8,574,000	20
Syracuse	18	$378	3,437,000	8
Utica	17	$353	871,000	7
	New York Statewide		**264,586,094**	**N/A**

Source: Texas Transportation Institute Urban Mobility Report, 2019.

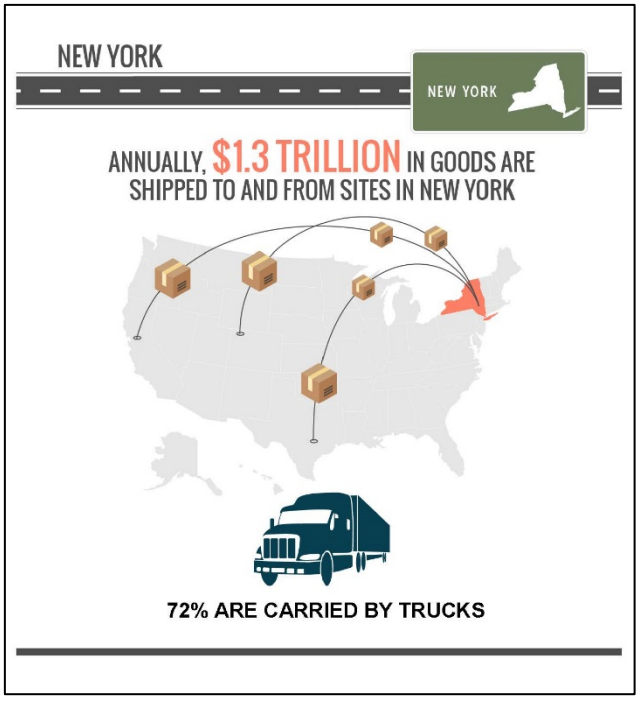
TRANSPORTATION AND ECONOMIC GROWTH

Today's culture of business demands that an area have well-maintained and efficient roads, highways and bridges if it is to remain economically competitive. Global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement, making the quality of a region's transportation system a key component in a business's ability to compete locally, nationally and internationally.

Businesses have responded to improved communications and the need to cut costs with a variety of innovations including just-in-time delivery, increased small package delivery, demand-side inventory management and e-commerce. The result of these changes has been a significant improvement in logistics efficiency as firms move from a push-style distribution system, which relies on large-scale warehousing of materials, to a pull-style distribution system, which relies on smaller, more strategic movement of goods. These improvements have made mobile inventories the norm, resulting in the nation's trucks literally becoming rolling warehouses.

Highways are vitally important to continued economic development in New York. As the economy expands, creating more jobs and increasing consumer confidence, the demand for consumer and business products grows. In turn, manufacturers ship greater quantities of goods to market to meet this demand, a process that adds to truck traffic on the state's highways and major arterial roads.

Every year, $1.3 trillion in goods are shipped to and from sites in New York, mostly by truck.[30] Seventy-two percent of the goods shipped annually to and from sites in New York are carried by truck and another 17 percent are carried by courier services or multiple-mode deliveries, which include trucking.[31] The value of freight shipped to and from sites in New York, in inflation-adjusted dollars, is expected to increase 154 percent by 2045 and by 108 percent for goods shipped by trucks.[32]



The ability of the nation's freight transportation system to efficiently and safely accommodate the growing demand for freight movement could be hampered by inadequate transportation capacity, a lack of adequate safety features on some transportation facilities,

institutional barriers to enhancing the nation's freight facilities, a lack of adequate funding for needed improvements to the freight network and a shortage of drivers.

The need to improve the U.S. freight network is occurring at a time when the nation's freight delivery system is being transformed by advances in vehicle autonomy, manufacturing, warehousing and supply chain automation, increasing e-commerce, and the growing logistic networks being developed by Amazon and other retail organizations in response to the demand for a faster and more responsive delivery and logistics cycle.

Investments in transportation improvements in New York play a critical role in the state's economy. A report by the American Road & Transportation Builders Association found that the design, construction and maintenance of transportation infrastructure in New York play a critical role in the state's economy, supporting the equivalent of 318,604 full-time jobs across all sectors of the state economy, earning these workers approximately $9.8 billion annually.[33] These jobs include 158,718 full-time jobs directly involved in transportation infrastructure construction and related activities and 159,886 full-time jobs as a result of spending by employees and companies in the transportation design and construction industry.[34]

Transportation construction in New York annually contributes an estimated $1.8 billion in state and local income, corporate and unemployment insurance taxes and the federal payroll tax. Approximately 3.5 million full-time jobs in New York in key industries like tourism, retail sales, agriculture and manufacturing are dependent on the quality, safety and reliability of the state's transportation infrastructure network. These workers earn $145 billion in wages and contribute an estimated $26.4 billion in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.[35]

Increasingly, companies are looking at the quality of a region's transportation system when deciding where to re-locate or expand. Regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient and more modern transportation system. Highway accessibility was ranked the number one site selection factor in a 2020 survey of corporate executives by Area Development Magazine.[36]

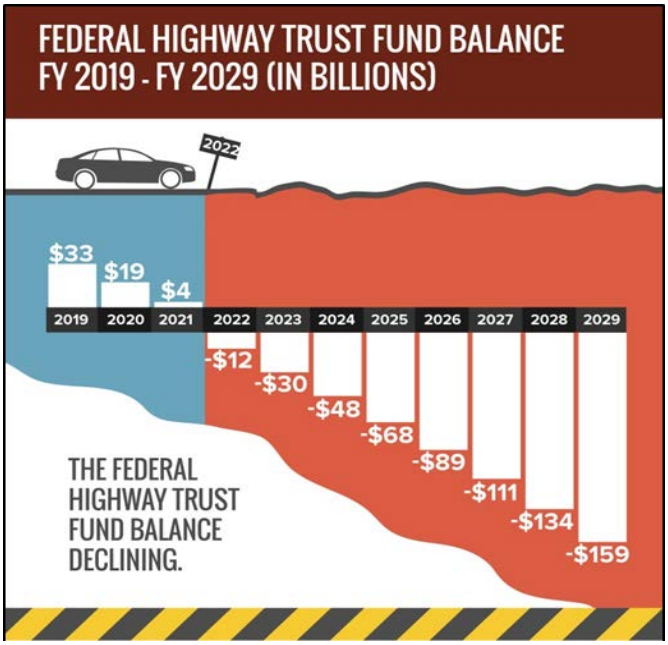
TRANSPORTATION FUNDING IN NEW YORK

Investment in New York's roads, highways and bridges is funded by local, state and federal governments. A lack of sufficient funding at all levels will make it difficult to adequately maintain and improve the state's existing transportation system.

Revenue from New York's motor fuel tax – a critical source of state transportation funding -- is likely to erode as a result of increasing vehicle fuel efficiency and the increasing use of electric vehicles. The average fuel efficiency of U.S. passenger vehicles increased from 20 miles per gallon in 2010 to 24.5 miles per gallon in 2020. Average fuel efficiency is expected to increase another 31 percent by 2030, to 32 miles per gallon, and increase 51 percent by 2040, to 37 miles per gallon.[37] The share of electric vehicles of total passenger vehicle sales in the U.S. is expected to increase to five percent by 2023 and 60 percent by 2040, by which time they will represent approximately 30 percent of the passenger vehicle fleet.[38]

Most federal funds for highway and transit improvements in New York are provided by federal highway user fees, largely an 18.4 cents-per-gallon tax on gasoline and a 24.4 cents-per-gallon tax on diesel fuel (additional revenue is generated by fees on the sale of large trucks, a highway use tax levied on vehicles in excess of 55,000 pounds and a tax on the sale of large truck tires).

Since 2008 revenue into the federal Highway Trust Fund has been inadequate to support legislatively set funding levels so Congress has transferred approximately $53 billion in general funds and an additional $2 billion from a related trust fund into the federal Highway Trust Fund.[39]



Signed into law in December 2015, the five-year Fixing America's Surface Transportation Act (FAST Act) was scheduled to expire on September 30, 2020. Congress extended the legislation for one year to September 30, 2021. The FAST Act provides modest increases in federal highway and transit spending. The 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 FAST-Act is a major source of funding for road, highway and bridge repairs in New York. Throughout the five years of the FAST-Act – fiscal years 2016 to 2020 – the program provided $8.9 billion to New York for road repairs and improvements, an average of $1.8 billion per year.[40] From

2014 to 2018, the federal government provided $1.28 for road improvements in New York for every $1.00 state motorists paid in federal highway user fees, including the federal state motor fuel tax.[41]

Federal funds are a critical source of highway investment in New York and represent a significant share of funds used by the state for major road, highway and bridge repairs and improvements. From 2014 to 2018, federal funds provided for highway improvements were the equivalent of 37 percent of the amount of New York state capital outlays on road, highway and bridge projects, including construction, engineering and right-of-way acquisition.[42]

New York federal-aid eligible roads, bridges and highways include the most critical routes in the state, including the Interstate Highway System, major highways and important rural and urban routes. Federal-aid eligible roadways in New York account for 28 percent of state lane-miles and carry 82 percent of all vehicle miles of travel in the state.[43] Fifty-nine percent of New York's bridges by count, and 87 percent of bridges measured by deck area are eligible for Federal aid.[44]

According to the Status of the Nation's Highways, Bridges, and Transit, 23rd Edition, submitted to Congress by the United States Department of Transportation (USDOT) in 2019, the nation faces a $786 billion backlog in needed repairs and improvements to the nation's roads, highways and bridges.[45] This backlog includes $435 billion for highway rehabilitation; $125 billion for bridge rehabilitation; $120 billion for system expansion and $106 billion for system enhancement.[46] 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 29 percent to $136 billion annually to improve the conditions of roads, highways and bridges, relieve traffic congestion and improve traffic safety.[47]

CONCLUSION

New York must work to provide a 21st century network of roads, highways, bridges and transit that can accommodate the mobility demands of a modern society.

The state will need to modernize its surface transportation system by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient, safe and reliable mobility for residents, visitors and businesses. Making needed improvements to New York's roads, highways, bridges and transit systems would provide a significant boost to the economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.

Numerous projects to improve the condition and expand the capacity of New York's roads, highways, bridges and transit systems will not be able to proceed without a substantial boost in local, state or federal transportation funding. If New York is unable to complete needed transportation projects it will hamper the state's ability to improve the condition and efficiency of its transportation system or enhance economic development opportunities and quality of life.

# # #

ENDNOTES

[1] Bridge condition data and safety data for each urban area includes the counties noted: Albany-Schenectady-Troy: Albany, Saratoga and Rensselaer Counties; Binghamton: Broome and Tioga Counties; Buffalo: Erie and Niagara Counties; New York: Kings, Queens, New York, Bronx, Richmond, Westchester, Rockland, Fairfield (CT), New Haven (CT), Bergen (NJ), Hudson (NJ), Middlesex (NJ), Monmouth (NJ), Ocean (NJ) and Passaic (NJ Counties; Poughkeepsie-Newburg: Duchess and Orange Counties; Rochester: Livingston, Monroe, Ontario, Orleans, Wayne and Yates Counties; Syracuse: Onondaga, Oswego and Madison Counties; Utica: Oneida County.
[2] U.S. Census Bureau (2018).
[3]Highway Statistics (2018). Federal Highway Administration. DL-1C.
[4] TRIP analysis of Bureau of Economic Analysis data.
[5] Ibid.
[6] U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2000 and 2018 and analysis of Federal Highway Administration Traffic Volume Trends (2018)
https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm
[7] Federal Highway Administration – Traffic Volume Trends.
https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm
[8] Federal Highway Administration (2019). Pavement condition data is for 2018.
[9] Ibid.
[10] Ibid.
[11] Ibid.
[12] Ibid.
[13] Ibid.
[14] Ibid.
[15] Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
[16] Pavement Maintenance, by David P. Orr, PE Senior Engineer, Cornell Local Roads Program, March 2006.
[17] TRIP calculation.
[18] Highway Development and Management: Volume Seven. Modeling Road User and Environmental Effects in HDM-4. Bennett, C. and Greenwood, I. 2000.
[19] Your Driving Costs. American Automobile Association. 2019.
[20] Federal Highway Administration National Bridge Inventory. 2018.
[21] Ibid.
[22] Ibid
[23] Federal Highway Administration National Highway Traffic Safety Administration, 2014-2018.
[24] TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data (2019). Data is for 2018.
[25] TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data (2018).
[26] Ibid.
[27] TRIP estimate based on NHTSA report "The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), 2016. P. 146.
[28] Ibid.
[29] The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised) (2015). National Highway Traffic Safety Administration. P. 1. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812013
[30] TRIP analysis of the Federal Highway Administration's Freight Analysis Framework. (2018).
https://faf.ornl.gov/fafweb/
[31] Ibid.
[32] Ibid.

[33] American Road & Transportation Builders Association (2015). The 2015 U.S. Transportation Construction Industry Profile. https://www.transportationcreatesjobs.org/pdf/Economic_Profile.pdf
[34] Ibid.
[35] Ibid.

[36] Area Development Magazine (2020). 34th Annual Survey of Corporate Executives: Availability of Skilled Labor New Top Priority. https://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2020/34th-annual-corporate-survey-16th-annual-consultants-survey.shtml
[37] KPMG. (2019). Evaluating Sustainable Transportation Funding Options.
[38] BloombergNEF (2019) New Energy Outlook 2019. https://about.bnef.com/new-energy-outlook/
[39] "Surface Transportation Reauthorization and the Solvency of the Highway Trust Fund," presentation by Jim Tymon, American Association of State Highway and Transportation Officials (2014).
[40] U.S. Department of Transportation (2020). Estimated FY 2016-2020 Apportionments Under the Fixing America's Surface Transportation Act. https://www.fhwa.dot.gov/fastact/funding.cfm
[41] TRIP analysis of Federal Highway Administration data (2020). Chart FE 221B in Highway Statistics 2018. https://www.fhwa.dot.gov/policyinformation/statistics/2018/
[42] TRIP analysis of Federal Highway Administration data (2020). Charts SF-1, SF-2 in Highway Statistics 2018. https://www.fhwa.dot.gov/policyinformation/statistics/2018/
[43] TRIP analysis of Federal Highway Administration data (2020). Charts VM-2, VM-3, HM-48, HM-60 in Highway Statistics 2018. https://www.fhwa.dot.gov/policyinformation/statistics/2018/
[44] TRIP analysis of Federal Highway Administration National Bridge Inventory data (2020). https://www.fhwa.dot.gov/bridge/fc.cfm All bridges excluding bridges classified as local or rural collector are eligible for federal aid.
[45] 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
[46] Ibid.
[47] Ibid.