New York Transportation by the Numbers

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

JANUARY 2022

TRIP
A National Transportation Research Nonprofit
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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 $28 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, while not the primary factor, were likely 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.

Location	VOC	Safety	Congestion	TOTAL
Albany-Schenectady-Troy	$423	$531	$796	$1,750
Binghamton	$244	$559	$377	$1,180
Buffalo-Niagara Falls	$420	$402	$1,044	$1,866
New York-Newark-Jersey City	$759	$326	$2,107	$3,192
Poughkeepsie-Newburgh-Middletown	$513	$668	$658	$1,839
Rochester	$375	$540	$832	$1,747
Syracuse	$568	$628	$409	$1,605
Utica	$313	$558	$382	$1,253
New York Statewide	**$7.7 Billion**	**$4.6 Billion**	**$15.4 Billion**	**$28 Billion**

NEW YORK ROADS PROVIDE A ROUGH RIDE

Due to inadequate state and local funding, nearly half 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 $632 annually in additional vehicle operating costs – a total of $7.7 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	16%	22%	21%	40%
Binghamton	8%	10%	23%	59%
Buffalo-Niagara Falls	14%	26%	23%	37%
New York-Newark-Jersey City	44%	24%	10%	22%
Poughkeepsie-Newburgh-Middletown	18%	38%	18%	26%
Rochester	12%	21%	29%	38%
Syracuse	32%	16%	9%	43%
Utica	7%	21%	30%	41%
New York Statewide	**26%**	**19%**	**19%**	**36%**

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	68	8%	481	57%	289	34%	838
Binghamton	30	4%	382	56%	271	40%	683
Buffalo - Niagara Falls	109	9%	544	47%	504	44%	1,157
New York -Newark-Jersey City	438	7%	4,414	66%	1,793	27%	6,645
Poughkeepsie-Newburgh-Middletown	117	15%	502	62%	187	23%	806
Rochester	109	9%	618	50%	511	41%	1,238
Syracuse	95	11%	527	60%	255	29%	877
Utica	47	10%	232	48%	208	43%	487
NEW YORK STATEWIDE	**1,672**	**10%**	**9,528**	**54%**	**6,355**	**36%**	**17,555**

TRAFFIC CONGESTION IN NEW YORK CAUSES DELAYS

In 2020, the state's transportation system carried 102 billion annual vehicle miles of travel (VMT). Congested roads choke commuting and commerce and cost New York drivers $15.4 billion each year in the form of lost time and wasted fuel. In the most congested urban areas, drivers lose up to $2,107 and as many as 92 hours per year due to traffic 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 eight percent below October 2019 volume by October 2021. 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	$796	7,341,000	21
Binghamton	16	$377	1,231,000	7
Buffalo - Niagara Falls	48	$1,044	14,094,000	23
New York -Newark-Jersey City	92	$2,107	323,712,000	38
Poughkeepsie-Newburgh-Middletown	37	$658	3,908,000	19
Rochester	40	$832	8,574,000	20
Syracuse	18	$409	3,437,000	8
Utica	17	$382	871,000	7
	New York Statewide		**264,586,094**	**N/A**

NEW YORK TRAFFIC SAFETY AND FATALITIES

A total of 5,019 people were killed in traffic crashes in New York from 2015-2019. In 2019, New York had 0.75 traffic fatalities for every 100 million miles traveled, lower than the national average of 1.11. The fatality rate on New York's non-interstate rural roads is more than two and a half times higher than on all other roads in the state (1.59 fatalities per 100 million vehicle miles of travel vs 0.59). From 2015 to 2019, there were 1,400 pedestrian and 197 bicycle fatalities in New York, 32 percent of the total number of traffic fatalities in the state.

Year	Total Fatalities	Pedestrian Fatalities	Bicycle Fatalities	Share Bike and Ped.
2015	1,121	311	36	31%
2016	1,025	307	39	34%
2017	999	246	46	29%
2018	943	268	30	32%
2019	931	268	46	34%
TOTAL	**5,019**	**1,400**	**197**	**32%**
AVERAGE	**1,004**	**280**	**39**	**32%**

Traffic crashes imposed a total of $13.9 billion in economic costs in New York in 2019 and traffic crashes in which a lack of adequate roadway safety features, while not the primary factor, 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 2015 and 2019, and the cost of traffic crashes per driver.

Location	Average Fatalities 2015-2019	Safety Costs per Driver
Albany-Schenectady-Troy	43	$531
Binghamton	18	$559
Buffalo - Niagara Falls	59	$402
New York -Newark-Jersey City	600	$326
Poughkeepsie-Newburgh-Middletown	52	$668
Rochester	72	$540
Syracuse	52	$628
Utica	17	$558

NEW YORK TRANSPORTATION FUNDING

Improvements to New York's roads, highways and bridges are funded by local, state and federal governments. Annual investment in roads, highways and bridges by the New York State Department of Transportation (NYSDOT) increased by 37 percent from 2018 to 2021 from approximately $4.3 billion to $6 billion. The level of NYSDOT highway investment is likely to increase further as a result of the five-year federal Infrastructure Investment and Jobs Act (IIJA), signed into law in November 2021, which will increase annual federal funding for New York roads, highways and bridges by 52 percent from an average of approximately $1.8 billion annually to $2.7 billion. Federal funds currently provide 38 percent of the revenue used by NYSDOT to fund highway and bridge improvements.

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.

TRANSPORTATION AND ECONOMIC DEVELOPMENT

The health and future growth of New York's economy is riding on its transportation system. Each year, $1 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.

Highway and bridge spending multiplies through the economy by stimulating additional output. A 2021 macroeconomic analysis by IHS Markit found that that every dollar spent on highway and bridge improvements results in $3.4 dollars in combined direct, indirect and induced output from industries throughout the economy, resulting in a multiplier for highway and bridge investment of 3.4

Sources of information for this report include the Federal Highway Administration (FHWA), the New York State Department of Transportation (NYSDOT), 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), HIS Markit and the National Highway Traffic Safety Administration (NHTSA). Cover page photo credit: David Golub.

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 ongoing response to 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 19.3 million residents in 2020.[2] New York had approximately 12.2 million licensed drivers in 2019.[3] From 2000 to 2020, New York's gross domestic product (GDP), a measure of the state's economic output, increased by 29 percent, when adjusted for inflation.[4] U.S. GDP increased 40 percent during the same period.[5] In 2020, the state's transportation system carried 102 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 eight percent below October 2019 levels by October 2021.[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 ensure the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.

Statewide, 45 percent of New York's major roads are in poor or mediocre condition. Twenty-six percent of New York's major locally and state-maintained roads are in poor condition and 19 percent are in mediocre condition.[8] Nineteen percent of New York's major roads are in fair condition and the remaining 36 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.

Forty-one percent of New York's major locally and state-maintained urban roads and highways have pavements rated in poor condition and 24 percent are in mediocre condition.[10] Fifteen percent of New York's major urban roads are rated in fair condition and the remaining 20 percent are rated in good condition.[11]

Five percent of New York's major locally and state-maintained rural roads and highways have pavements rated in poor condition and 12 percent are in mediocre condition.[12] Twenty-four percent of New York's major rural roads are rated in fair condition and the remaining 58 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.

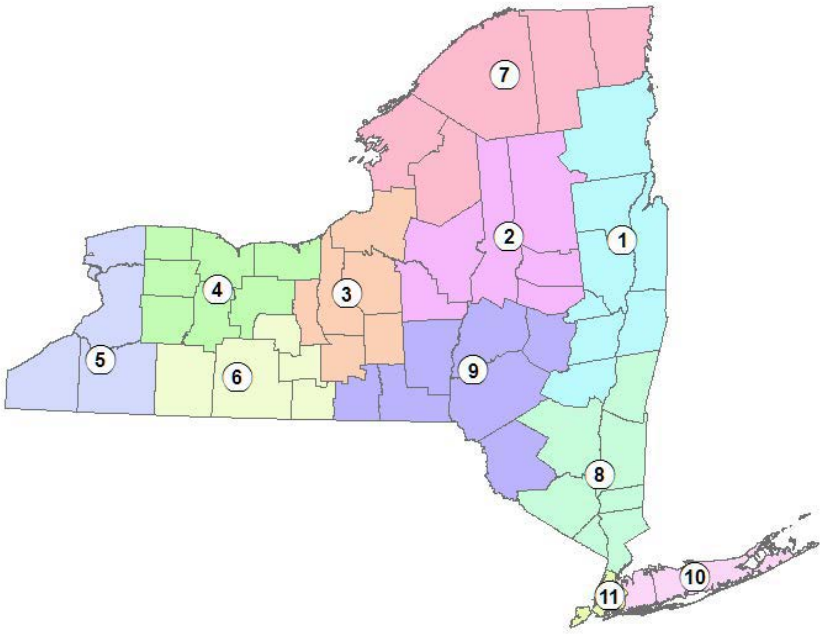
Location	Poor	Mediocre	Fair	Good
Albany-Schenectady-Troy	16%	22%	21%	40%
Binghamton	8%	10%	23%	59%
Buffalo-Niagara Falls	14%	26%	23%	37%
New York-Newark-Jersey City	44%	24%	10%	22%
Poughkeepsie-Newburgh-Middletown	18%	38%	18%	26%
Rochester	12%	21%	29%	38%
Syracuse	32%	16%	9%	43%
Utica	7%	21%	30%	41%
New York Statewide	**26%**	**19%**	**19%**	**36%**

Source: TRIP analysis of Federal Highway Administration data.

The share of NYSDOT maintained roads and highways in poor to fair condition increased from 36.7 percent in 2016 to 45.2 percent in 2020.[15] The following chart indicates the share of NYSDOT maintained roads and highways in each highway district that are in poor and fair condition or good and excellent condition in 2020.

Chart 2. 2020 Pavement Condition of NYSDOT Maintained Roadways by Highway District.

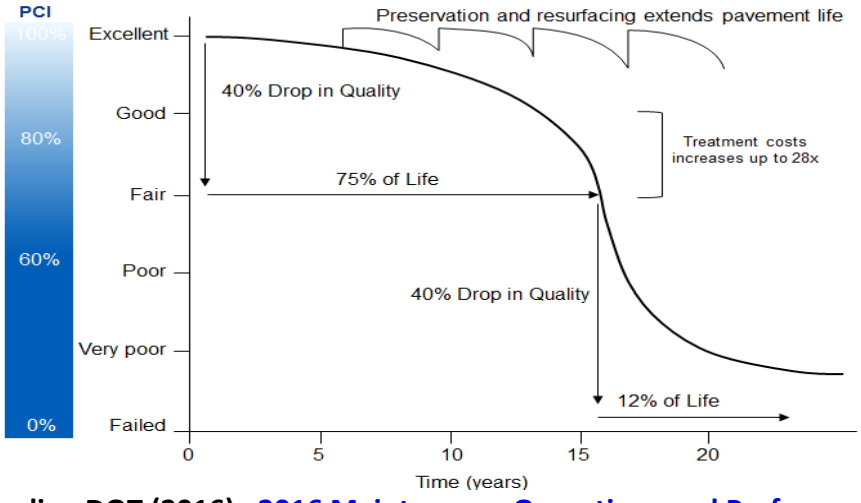
Region	Poor & Fair	Good & Excellent
1	44	56
2	32.7	67.3
3	53.7	46.3
4	46.6	53.4
5	47.4	52.6
6	47.4	52.6
7	31.9	68.1
8	58.5	41.5
9	53.6	46.4
10	34	66
11	7.1	92.9
State	**45.2**	**54.8**



Source: NYSDOT

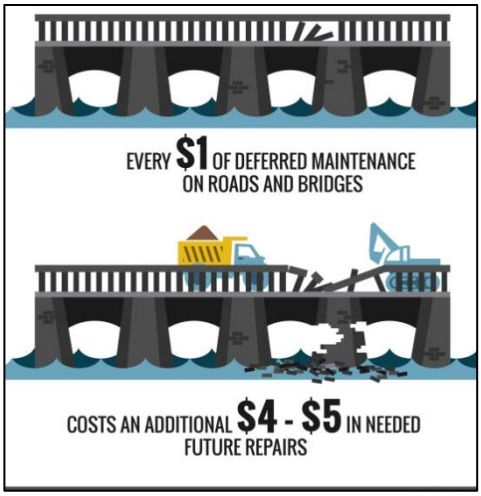
Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are more prone to deterioration because the slow-moving or standing loads occurring at these 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.[16] 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 3. Pavement Condition Cycle Time with Treatment and Cost.



Source: North Carolina DOT (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.[17]



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 $7.7 billion annually, an average of $632 per driver statewide.[18] 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 4. Annual 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	$423	8,336,182	21
Binghamton	$244	1,859,462	12
Buffalo - Niagara Falls	$420	14,734,709	20
New York -Newark-Jersey City	$759	363,516,328	40
Poughkeepsie-Newburgh-Middletown	$513	9,486,598	24
Rochester	$375	11,977,403	18
Syracuse	$568	11,900,915	29
Utica	$313	2,144,833	15
New York Statewide	**$7.7 Billion**	**391,627,101**	**32**

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.[19] 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.

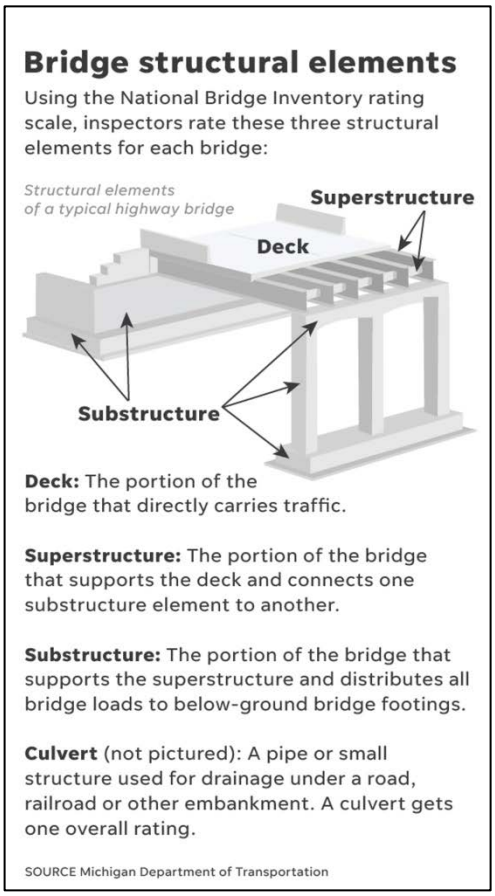
TRIP's additional VOC estimate is based on taking the average number of miles driven annually by a motorist, calculating current VOC based on AAA's driving cost estimates and then using the HDM model to estimate the additional VOC paid by drivers as a result of substandard roads.[20] Additional research 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 (1,672 of 17,555) of New York's locally and state-maintained bridges are rated in poor/structurally deficient condition.[21] 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 (9,528 of 17,555) of New York's locally and state-maintained bridges are rated in fair condition.[22] 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 (6,355 of 17,555) of the state's bridges are rated in good condition.[23]

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

Chart 5. 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	68	8%	481	57%	289	34%	838
Binghamton	30	4%	382	56%	271	40%	683
Buffalo - Niagara Falls	109	9%	544	47%	504	44%	1,157
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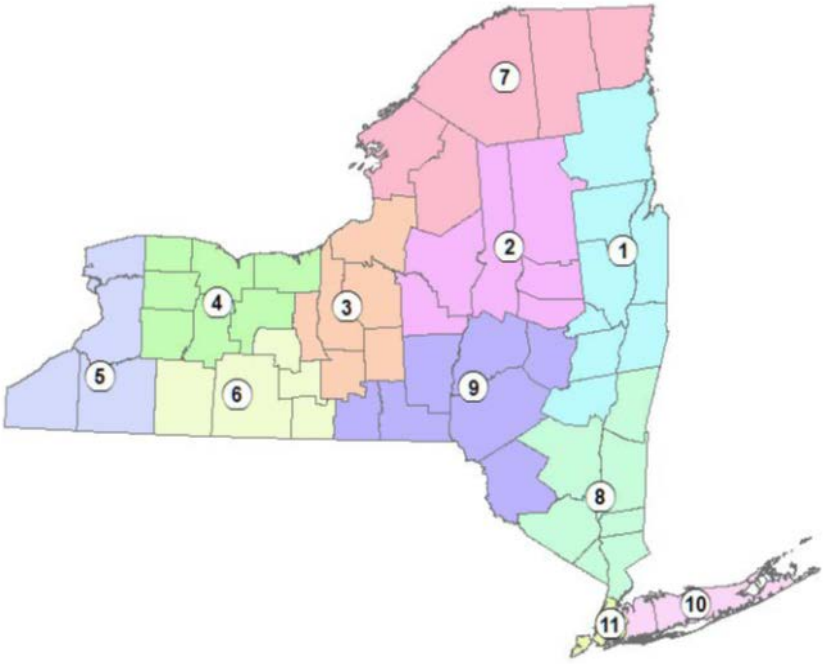
Syracuse	95	11%	527	60%	255	29%	877
Utica	47	10%	232	48%	208	43%	487
NEW YORK STATEWIDE	**1,672**	**10%**	**9,528**	**54%**	**6,355**	**36%**	**17,555**

Source: TRIP analysis of Federal Highway Administration National Bridge Inventory (2021).

The following chart indicates the condition of New York state and local bridges in 2020 by highway district.

Chart 6. 2020 State and Locally Maintained Bridge Conditions by Highway District.

Region	Poor & Fair	Good & Excellent
1	28.6	71.4
2	19.5	80.5
3	32.2	67.8
4	17.8	82.2
5	13.6	86.4
6	17.9	82.1
7	14.3	85.7
8	45.9	54.1
9	24.8	75.2
10	13.4	86.6
11	35.7	64.3
State	**25.3**	**74.7**



Source: NYSDOT

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 5,019 people were killed in New York traffic crashes from 2015 to 2019, an average of 1,004 fatalities per year.[24] New York's overall traffic fatality rate of 0.75 fatalities per 100 million vehicle miles of travel in 2019 is lower than the national average of 1.11.[25] The fatality rate on New York's non-interstate rural roads is more than two and a half times higher than on all other roads in the state (1.59 fatalities per 100 million vehicle miles of travel vs 0.59).[26] While New York's rural roads account for only 16 percent of vehicle travel in the state, 33 percent of fatalities occur on New York's rural roads.[27] From 2015 to 2019, there were 1,400 pedestrian and 197 bicycle fatalities in New York, 32 percent of the total number of traffic fatalities in the state.[28]

Chart 7. New York Traffic Fatalities, 2015-2019.

Year	Total Fatalities	Pedestrian Fatalities	Bicycle Fatalities	Share Bike and Ped.
2015	1,121	311	36	31%
2016	1,025	307	39	34%
2017	999	246	46	29%
2018	943	268	30	32%
2019	931	268	46	34%
TOTAL	**5,019**	**1,400**	**197**	**32%**
AVERAGE	**1,004**	**280**	**39**	**32%**

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, while not the primary factor, 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.

The chart below details the number of people killed in traffic crashes in the state's largest urban areas between 2015 and 2019, and the cost of traffic crashes per driver.

Chart 8. Average fatalities between 2015 and 2019 and crash cost per driver.

Location	Average Fatalities 2015-2019	Safety Costs per Driver
Albany-Schenectady-Troy	43	$531
Binghamton	18	$559
Buffalo - Niagara Falls	59	$402
New York -Newark-Jersey City	600	$326
Poughkeepsie-Newburgh-Middletown	52	$668
Rochester	72	$540
Syracuse	52	$628
Utica	17	$558

Source: TRIP analysis.

Traffic crashes in New York imposed a total of $13.9 billion in economic costs in 2019.[29] TRIP estimates that roadway features, while not the primary factor, 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.[30] 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.[31]

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 $15.4 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 9. 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	$796	7,341,000	21
Binghamton	16	$377	1,231,000	7
Buffalo - Niagara Falls	48	$1,044	14,094,000	23
New York -Newark-Jersey City	92	$2,107	323,712,000	38
Poughkeepsie-Newburgh-Middletown	37	$658	3,908,000	19
Rochester	40	$832	8,574,000	20
Syracuse	18	$409	3,437,000	8
Utica	17	$382	871,000	7
	New York Statewide		**264,586,094**	**N/A**

Source: TRIP analysis of 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 trillion in goods are shipped to and from sites in New York, mostly by truck.[32] Seventy-five 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.[33] 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.[34]

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.[35] 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.[36]

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.[37]

Highway and bridge spending multiplies through the economy by stimulating additional output. A 2021 macroeconomic analysis by IHS Markit found that that every dollar spent on highway and bridge improvements results in $3.4 dollars in combined direct, indirect and induced output from industries throughout the economy, resulting in a multiplier for highway and bridge investment of 3.4.[38]

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 access has a significant impact on the competitiveness of a region's economy. Not surprisingly, highway accessibility was ranked the number two site selection factor in the 2021 survey of corporate executives by Area Development Magazine, behind only skilled labor.[39]

TRANSPORTATION FUNDING IN NEW YORK

Improvements to New York's roads, highways and bridges is funded by local, state and federal governments. Annual investment in roads, highways and bridges by the New York State Department of Transportation (NYSDOT) increased by 37 percent from 2018 to 2021, from approximately $4.3 billion to $6 billion.[40] The level of NYSDOT highway investment is likely to increase further as a result of the five-year federal Infrastructure Investment and Jobs Act (IIJA), signed into law in November 2021, which will increase annual federal funding for New York roads, highways and bridges by 52 percent from an average of approximately $1.8 billion annually to $2.7 billion.[41] Federal funds currently provide 38 percent of the revenue used by NYDOT to fund highway and bridge improvements.[42]

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).

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.[43] 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.[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.

The recent approval of the IIJA provides New York with an opportunity to move forward with numerous projects to improve the condition and expand the capacity of New York's roads, highways, bridges and transit systems, but will still require further increases in state and local transportation investment to supplement the additional federal transportation funding from the IIJA. 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 (2020).
[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 2020. https://www.fhwa.dot.gov/policyinformation/statistics/2020/
[7] Federal Highway Administration (2021). Traffic Volume Trends. https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm
[8] Federal Highway Administration (2021). Pavement condition data is for 2020.
[9] Ibid.
[10] Ibid.
[11] Ibid.
[12] Ibid.
[13] Ibid.
[14] Ibid.
[15] New York State Department of Transportation (2021). Annual Highway Pavement and Bridge Condition Report SFY 2021-22.
[16] Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
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[20] Your Driving Costs. American Automobile Association. 2021. https://newsroom.aaa.com/wp-content/uploads/2021/08/2021-YDC-Brochure-Live.pdf
[21] Federal Highway Administration National Bridge Inventory. 2021.
[22] Ibid.
[23] Ibid
[24] Federal Highway Administration National Highway Traffic Safety Administration, 2014-2018.
[25] TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data (2020). Data is for 2019.
[26] Ibid.
[27] Ibid.
[28] Ibid.
[29] TRIP estimate based on NHTSA report "The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), 2016. P. 146.
[30] Ibid.
[31] 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
[32] TRIP analysis of the Federal Highway Administration's Freight Analysis Framework. (2018). https://faf.ornl.gov/fafweb/
[33] Ibid.
[34] Ibid.

[35] American Road & Transportation Builders Association (2015). The 2015 U.S. Transportation Construction Industry Profile. https://www.transportationcreatesjobs.org/pdf/Economic_Profile.pdf
[36] Ibid.
[37] Ibid.
[38] IHS Markit (2021). Economic Impacts of Transportation Infrastructure. ARTBA_EIA_IIJA_Report_Sept2021.pdf
[39] Area Development Magazine (2021). 35th Annual Corporate Survey: Effects of Global Pandemic Reflected in Executives Site and Facility Plans _ https://www.areadevelopment.com/corporate-consultants-survey-results/q1-2021/35th-annual-corporate-survey.shtml
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[41] Ibid.
[42] Ibid.
[43] KPMG. (2019). Evaluating Sustainable Transportation Funding Options.
[44] BloombergNEF (2019) New Energy Outlook 2019. https://about.bnef.com/new-energy-outlook/
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[46] Ibid.
[47] Ibid.