

**The Cost of Traffic Congestion in
Delaware:
The State's 25 Worst Traffic Jams
and Needed Steps to Relieve
Traffic Congestion**

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Founded in 1971, TRIP® of Washington, DC is a nonprofit organization that researches, evaluates and distributes condition, use and related information on highways and other transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway engineering, construction and finance; labor unions; and organizations concerned with an efficient and safe highway transportation network.

Executive Summary

Delaware's extensive network of roads and bridges plays a vital role in serving the state's residents, visitors and businesses. While the state's natural beauty, historic significance and ocean shores attract thousands of tourists each year, Delaware's location along one of the nation's most vital north-south Interstate corridors and growing industries bring millions of travelers to the state's roads.

However, sharp increases in population and vehicle travel in recent years have led to growing congestion on Delaware's key routes, and made commuting to work, visiting tourist attractions and moving goods and services more difficult in the state. Increasing congestion in Delaware threatens to erode quality of life in the state, deter some tourism and slow the movement of goods, hurting the state's economic competitiveness.

This report identifies the 25 most congested routes in Delaware. By estimating the annual congestion-related delays on Delaware's major routes, TRIP has also been able to calculate the total amount of time, fuel and money lost by motorists on each of the most congested routes. The report examines travel and population trends in the state, looks at current and future congestion levels, lists projects needed to relieve traffic congestion in Delaware and looks at the state's transportation funding needs.

Needed improvements must be made to the state's highway transportation system if Delaware's residents, visitors and businesses are to continue to enjoy sustained economic growth, a high quality of life and reliable access to the state's recreational destinations. However, the state currently lacks adequate funding to provide for needed highway transportation expansions and improvements. According to the Delaware Department of Transportation (DelDOT), the state faces a transportation funding shortfall of \$1.5 billion dollars from Fiscal Years 2008 to 2013. Without additional transportation funding, Delaware's roads will become increasingly congested, while road and bridge conditions deteriorate.

TRIP's report is based on information obtained from the Delaware Department of Transportation, the Federal Highway Administration, the Urban Land Institute and The Reason Foundation. The congestion rankings and cost estimates are TRIP's calculations, based partly on methodologies established by the Texas Transportation Institute to measure the impact of urban traffic congestion on consumers. TRIP's congestion model uses facility design, traffic counts and speed limits to estimate speeds during peak and non-peak hours.

Traffic congestion on Delaware's key routes costs motorists as much as \$1,105 annually in wasted time and fuel, depending on which route they use for their daily commute.

- The most costly traffic delays for average Delaware commuters based on TRIP's calculations are on a section of I-95 from Route 273 to the Route 141 Interchange, which costs an average driver commuting on this route \$1,015 annually, wasting 59 hours and 36 gallons of fuel each year; a segment of Route 1 from Route 273 to the I-95 Interchange, which costs the average commuter \$778 annually, wasting 45 hours and 27 gallons of fuel each year; and a segment of Route 273 from 6th Street in New Castle County to U.S. 13, which costs the average commuter \$711 annually, wasting 41 hours and 25 gallons of fuel each year.
- This report contains a list of the 25 most congested routes in the state, with the highest total congestion cost and the most hours of time and gallons of fuel wasted each year.

Delaware faces a \$1.5 billion shortfall from Fiscal Year 2008-2013 in needed transportation funding. The Delaware Department of Transportation, metropolitan planning organizations and Sussex County has compiled a list of needed, but unfunded highway projects around the state that would relieve congestion, improve road and bridge conditions and enhance traffic safety.

- According to DelDOT, the state faces a transportation funding shortfall of \$1.5 billion dollars from Fiscal Year 2008-2013. Without additional transportation funding, Delaware's roads will become increasingly congested, while road and bridge conditions deteriorate.
- DelDOT estimates that between Fiscal Year 2008-2016, approximately \$2.5 billion is available to improve road and bridge conditions, make roadway safety improvements and address needed traffic congestion relief.
- DelDOT estimates that between Fiscal Year 2008 and 2013, it will need approximately \$4 billion to make many needed improvements, resulting in a shortfall of \$1.5 billion over the next six years.
- This report contains a list of needed but unfunded projects in the state that would relieve congestion on Delaware's highways. The full list can be found in the body of the report.
- Needed but currently unfunded projects in Delaware include the following: new U.S. Route 301 in New Castle County from the Maryland Line to Rt. 1 near the C&D Canal to address congestion, growth and safety; the West Dover Connector in Kent County from Route 8 to Route 13 to address growth in the area; the Western Parkway in Sussex County from Rt. 24 to the Route 1/9 intersection to provide capacity for area development.

Traffic congestion levels in Delaware are rising, as vehicle travel on the state's roadways has increased more than three times faster than additional roadway capacity has been added.

- Delaware's population reached 855,000 in 2006, an increase of approximately 28 percent since 1990. Delaware's population is projected to increase by another 14 percent by 2020, to approximately 979,000 residents.
- Vehicle travel on Delaware's major highways increased by 45 percent from 1990 to 2005 – jumping from 6.5 billion vehicle miles traveled (VMT) in 1990 to 9.5 billion VMT in 2005 (the latest year for which data is available).
- Vehicle travel in Delaware is expected to increase by another 35 percent by 2020, reaching 12.8 billion VMT.
- Thirty-three percent of Delaware's urban Interstates and other highways or freeways are considered congested, because they carry a level of traffic that is likely to result in significant delays during peak travel hours.
- The average rush hour trip in the Wilmington area (which is included in the Philadelphia metropolitan area) currently takes approximately 32 percent longer to complete than during non-rush hour.
- By 2030, unless additional roadway capacity is added, travel delays in the heavily urbanized northern portion of Delaware (which includes Wilmington and the Philadelphia metropolitan area) will nearly double, with the average rush hour trip taking 61 percent longer to complete than during non-rush hours. This level of traffic delay is worse than any present-day city in the United States with the exception of Los Angeles.
- While the average rush hour trip in the Dover area takes only four percent longer to complete than during non-rush hour, the relative increase in delay projected over the next 25 years is 100 percent, which will be sharply noticed by local commuters. This projected level of delay is the same as currently experienced by drivers in Cleveland, Richmond and Spokane.

While the state has taken steps towards easing traffic congestion, a comprehensive approach is required. This includes expanding capacity of the state's integrated transportation system, improving the efficiency of the existing system and offering alternatives for some peak-hour trips. Delaware's plan for traffic congestion relief should continue to include:

- Effectively increasing the transportation system through expanded road and highway capacity, improved freight movement corridors, an improved, affordable transit system and new and improved sidewalks and bike paths.

- Improving traffic flow and system efficiency through better traffic signalization, ramp metering, faster accident response times and driver information systems.
- Programs to reduce the number of peak-hour vehicle trips, including telecommuting, flextime and ridesharing programs.

Introduction

Long commutes and snarled traffic have long been the calling cards of the nation's largest urban areas, but congestion has increasingly spread to smaller areas such as Delaware. Sharp increases in population and vehicle travel, without a corresponding increase in roadway capacity, have led to growing congestion on Delaware's key routes, and made commuting to work, visiting tourist attractions and moving goods and services more difficult in the state. Increasing congestion in Delaware threatens to erode quality of life in the state, deter some tourism and slow the movement of goods, hampering the state's economic competitiveness.

The increase in traffic congestion is more than a time-wasting nuisance to commuters. High levels of traffic congestion have been found to reduce worker productivity and increase shipment costs, which impacts the competitiveness of metropolitan manufacturers and other businesses. Increasing levels of traffic congestion in Delaware may also hurt the region's economy by discouraging some tourists from visiting the region and making the state less attractive to businesses and industries looking to relocate or expand their operations.

Most importantly, congestion and unimproved roadways are a safety concern, leading to more crashes and fatalities.

This report identifies the most congested routes in Delaware and quantifies the annual cost to motorists who use these routes regularly in terms of time and fuel wasted and overall congestion costs. This report also examines transportation funding in Delaware and contains a list of needed but unfunded projects, as identified by DeIDOT, that would relieve congestion, improve road and bridge conditions and enhance traffic

safety. A set of recommendations for a comprehensive approach to relieving traffic congestion is also included in the report.

The ability of communities to adequately address traffic congestion has a significant impact on an area's livability. The Urban Land Institute notes that traffic congestion has the potential to hinder a region's ability to attract residents and businesses and degrades local quality-of-life. ¹

High levels of traffic congestion also have been found to result in diminished air quality. Conversely, steps that reduce congestion can result in improved air quality. The Transportation Research Board, an agency of the National Research Council, reports that strategies that reduce traffic congestion by improving traffic flow also reduce vehicle emissions, thus improving air quality. ²

Sources of information for this report include the Delaware Department of Transportation, the Federal Highway Administration, the Urban Land Institute, the Reason Foundation and the Texas Transportation Institute.

Population and Vehicle Travel Growth in Delaware

Congestion on Delaware's key roads and highways, particularly during peak hours, continues to increase as population and traffic levels rise at a significant rate. Delaware's population increased by 28 percent from 1990 to 2006, reaching 855,000 residents. The state's population is expected to increase by another 14 percent by 2020, to approximately 979,000 residents.

The tremendous increase in population in the state has led to a corresponding increase in traffic on Delaware's roads and highways. In addition, in the summer months, Delaware's roadways become even more congested as travelers head to coastal beaches, which is important to the state's economy. Vehicle travel in Delaware increased 45 percent from 1990 to 2005 (the latest year for which data is available), from 6.5 billion vehicle miles traveled (VMT) to 9.5 billion VMT, rapidly increasing the amount of traffic on the state's roads. Vehicle travel in Delaware is expected to increase by 35 percent by 2020, to 12.8 billion annual VMT.³

From 1990 to 2005, overall lane miles and miles of highways or freeways in Delaware increased by approximately 14 percent. Thus, vehicle travel in the state increased at a rate more than three times faster than new capacity was added to the system.⁴

Traffic Congestion in Delaware

Traffic congestion is a growing burden in Delaware's key urban areas and threatens to impede the state's economic development. Congestion on the state's urban highways is worsening as a result of steady increases in vehicle travel. In 2005, the latest year for which data is available, 33 percent of Delaware's urban Interstates and other highways or freeways were considered congested, because they carry a level of traffic that is likely to result in significant delays during peak travel hours.⁵

The average rush hour trip in the Wilmington area (which is included in the Philadelphia metropolitan area) currently takes approximately 32 percent longer to complete than during non-rush hour.⁶

According to a recent report by the Reason Foundation, by 2030, unless additional roadway capacity is added, travel delays in the heavily urbanized northern portion of Delaware (which includes Wilmington and the Philadelphia metropolitan area) will nearly double, with the average rush hour trip taking 61 percent longer to complete than during non-rush hours. This level of traffic delay is worse than any present-day city in the United States, with the exception of Los Angeles.⁷

While the average rush hour trip in the Dover area takes only four percent longer to complete than during non-rush hour, the relative increase in delay projected over the next 25 years is 100 percent, which will be sharply noticed by local commuters. This projected level of delay is the same as currently experienced by drivers in Cleveland, Richmond and Spokane.⁸

Delaware's Most Congested Roadways

To identify and assess Delaware's 25 most congested roadways, TRIP analyzed data provided by the Delaware Department of Transportation. Traffic data was provided for Interstates, freeways and key arterial streets that had very high levels of daily traffic per-lane-mile. TRIP's methodology, based on the Texas Transportation congestion estimates, uses facility design, speed limits and traffic counts to estimate speeds during peak and non-peak hours. This methodology does not include routes where delays are caused by toll facilities.

Interstate highways and other freeways, because of limited access and other design advantages, can carry up to 15,000 vehicles daily per-lane before experiencing significant congestion, according to the FHWA. Arterial routes, typically key routes that

often include intersections and traffic lights, can carry up to 5,500 vehicles daily per-lane before experiencing significant congestion. When traffic exceeds these levels, traffic speeds are reduced, resulting in delays.⁹

According to the Texas Transportation Institute (TTI), as average vehicle travel on freeways and arterial routes increases above congested levels, average speeds decrease in proportion to the level of increased traffic, based on studies of traffic movement on various types of roadways. A variety of strategies to improve traffic flow can improve the ability of a highway or road to carry additional traffic efficiently. These strategies include reverse-flow lanes, ramp metering on entrance ramps and motorist assistance programs that reduce traffic delays caused by stalled vehicles or accidents.

TRIP used TTI traffic speed estimates to calculate the average speed of traffic on Delaware's key routes during peak hours. By comparing average vehicle speeds on congested routes to average speeds on non-congested routes, TRIP was able to estimate the additional time spent driving due to congestion for key routes in the region. TRIP set the value of each additional hour spent in traffic at \$15.44, based on the 2005 TTI traffic congestion report, adjusted to 2007 dollars. The cost of fuel used is \$3.07 per gallon, which reflects the latest average price figure from AAA. The following table indicates the 25 street or highway sections in Delaware with the highest congestion costs per motorist, based on weekday travel per-lane-mile, in comparison to the carrying capacity of the route.

The most costly traffic delays for average Delaware commuters based on TRIP's calculations are on a section of I-95 from Route 273 to the Route 141 Interchange, which costs an average driver commuting on this route \$1,015 annually, wasting 59 hours and 36 gallons of fuel each year; a segment of Route 1 from Route 273 to the I-95 Interchange,

which costs the average commuter \$778 annually, wasting 45 hours and 27 gallons of fuel each year; and a segment of Route 273 from 6th Street in New Castle County to U.S. 13, which costs the average commuter \$711 annually, wasting 41 hours and 25 gallons of fuel each year.

Table 1. Top 25 most congested routes in Delaware ranked by greatest annual cost in wasted time and fuel per motorist commuting on this route.

Rank	County	Route	From	To	Peak Congestion Period	Annual Hours Wasted	Gallons of Fuel Wasted	Total Congestion Cost
1	NCC	I-95	SR 273	SR 141 Interchange	Jan-May	59	36	\$ 1,015
2	NCC	SR 1	SR 273	I-95 Interchange	June-Aug	45	27	\$ 778
3	NCC	SR 273	6th St (New Castle)	US 13		41	25	\$ 711
4	NCC	Marsh/Silverside Rds	I-95	Shipley Rd		39	24	\$ 682
5	NCC	SR 2 (Kirkwood Highway)	Possum Park Rd.	SR 41		37	23	\$ 647
6	Sussex	DE 1	Five Points	SR 24	May-Sept	37	23	\$ 643
7	NCC	SR 7/SR 4	SR 318 Milltown Rd	Beginning SR 1		37	22	\$ 634
8	Kent	US 13	Scarborough Rd	Rt 113 Split	June-Aug	35	21	\$ 604
9	NCC	SR 72	Possum Park Rd.	Cleveland Ave.		35	21	\$ 600
10	NCC	SR2 (Elkton Rd.)	Otts Chapel Rd.	Main St., Barksdale Rd.		33	20	\$ 576
11	NCC	SR 141	Faulkland Rd.	Rockland Rd.		33	20	\$ 575
12	NCC	US 202	I-95	Woodlawn Rd.		33	20	\$ 566
13	NCC	US 13	SR 40 Split	Memorial Drive		32	20	\$ 557
14	NCC	SR 52 (Delaware Ave.)	SR 141	12th St.		29	18	\$ 507
15	NCC	SR 299	SR 1 Ramp	US 301		28	17	\$ 490
16	NCC	US 301	SR 71 (Main St.)	SR 896 (Boyd's Corner Rd.)	June-Aug	28	17	\$ 477
17	Sussex	DE 1	SR 24	DE 1 Rd 14	May-Sept	27	16	\$ 468
18	NCC	SR 48 (Lancaster Ave.)	SR 141	King St.		27	16	\$ 465
19	NCC	New Linden/Red Mill/Polly Drummond Rds.	Ruthar Dr.	SR 7		26	16	\$ 451
20	Sussex	DE 1	SR 16	Five Points	May-Sept	26	16	\$ 444
21	NCC	SR 41	PA/DE Line	SR2/SR 41 Intersection		25	15	\$ 435
22	Sussex	DE 1	SR 26	South Bethany (York Road)	May-Sept	25	15	\$ 433
23	NCC	US 40	Appleby Rd.	Salem Church Rd.		25	15	\$ 430
24	Sussex	SR 26	SR 17	DE 1	May-Sept	18	11	\$ 308
25	NCC	SR 7	US 40	SR 273		17	10	\$ 296

Source: TRIP analysis of Delaware Department of Transportation data

To estimate the number of additional hours spent driving annually because of traffic congestion on key Delaware routes, TRIP compared travel time on these routes under non-congested conditions and under the levels of traffic congestion that occur on these routes. The actual number of hours spent in congestion and the costs per driver can vary depending on the length of a person's commute on any of these routes.

Transportation Funding and Unmet Needs

According to the Delaware Department of Transportation (DelDOT), the state faces a transportation funding shortfall of \$1.5 billion dollars from Fiscal Years 2008 to 2013. Without additional transportation funding, Delaware's roads will become increasingly congested, while road and bridge conditions deteriorate.

DelDOT estimates that between Fiscal Year 2008-2013, approximately \$2.5 billion is available to improve road and bridge conditions, make roadway safety improvements and address needed traffic congestion relief. However, the state estimates that between Fiscal Year 2008-2013, it will need approximately \$4 billion to make all needed improvements, resulting in a backlog of \$1.5 billion over the next six years.

DelDOT has compiled the following list of needed but unfunded projects in the state that would relieve congestion and improve safety and pavement conditions on Delaware's highways. Needed but unfunded projects in Delaware include the following: new U.S. Route 301 in New Castle County from the Maryland Line to Route 1 near the C&D Canal to address congestion, growth and safety; the West Dover Connector in Kent County from Route 8 to Route 13 to address growth in the area; the Western Parkway in

Sussex County from Route 24 to the Route 1/9 intersection to provide capacity for area development.

Table 2. Needed but unfunded highway projects in Delaware.

County	Route	From	To	Length (Mi.)	Lanes	Project Description	Needs to be addressed	Estimated cost
NCC	New U.S. Route 301	Maryland Line	Rt. 1 near C&D Canal	16	4	limited access highway	congestion and safety, and growth	\$500 million-\$600 million
NCC	SR 299	SR 1 Ramp	U.S. 301	2.8	2	capacity improvements	Severe congestion	unknown
Sussex	SR 54	US 113	DE 1	11.4	2	widen lanes, center lane, shoulders, sidewalks	growth	\$27 million
Sussex	SR 26	SR 17	DE 1	1.7	2	capacity and safety	growth	\$55 million
Kent	West Dover Connector	Rt. 8	Rt. 13	2	2	capacity	growth	\$45 million
NCC	SR 2 (Elkton Rd.)	Ottis Chapel Road	Main St., Barksdale	2.3	4	expansion, ped and bike	congestion, safety, road conditions	\$90 million
NCC	I-95 Toll Plaza	Newark	Newark	0	n/a	add high speed E-ZPass lanes	Congestion	\$81 million
NCC	Rt. 13/Philadelphia Pike	I-495	Harvey Road	2		operational, safety	Safety	\$19 million
NCC	I-95/Rt. 202 Interchange	Wilmington	Wilmington	0	N/A	add off ramp lanes	prevent weaving	\$38 million
NCC	I-95/Rt. 1 interchange	Christiana	Christiana	0	n/a	expand interchange	operational	\$133 million
Kent	RT. 1/Rt. 9 Intersection	Dover Air Force Base	Dover Air Force Base	0	n/a	grade separate intesection	safety/security for DAFB	\$14 million
Kent	Rt. 1/Little Heaven intersection	Little Heaven	Little Heaven	0	n/a	grade separate intesection/service roads	safety, growth	\$44 million
Kent	Rt. 1/Thompsonville Rd.	Thompsonville Rd	Rt. 1	0	n/a	grade separate intersection	safety, growth	\$24 million
Kent	Rt. 1/Frederica (2 locations)	Frederica	Rt. 1	0	n/a	grade separate intersections	safety, growth	\$36 million
Sussex	Western Parkway	Rt. 24	Rt. 1/Rt. 9 intersection	2	6	new alternate to Rehoboth Beach	congestion	\$126 million
Sussex	Rt. 24	Love Creek	Rt. 1	2	2	widen to 4 lanes	growth	\$19 million

Source: Delaware Department of Transportation

Solutions to Relieve Traffic Congestion

While the state has taken steps to relieve traffic congestion, a comprehensive approach is required in order to provide motorists with a more efficient transportation system. This approach should continue to include strategies to increase the capacity of the regions' transportation system, to improve the efficiency of the existing system and to reduce some travel demand, particularly during peak periods.

In order to accommodate the continued growth in travel demand without experiencing a significant increase in traffic congestion, Delaware will need to expand the capacity of its roadway and transit systems as well as make further improvements in the efficiency of its transportation system.

A comprehensive approach to providing traffic congestion relief should be built on current efforts to provide local traffic congestion relief. Congestion relief plans in Delaware should continue to include the following strategies:

Expand capacity of the regional transportation system

- **Additional traffic lanes and turn lanes.** Expanding capacity, particularly on routes that are carrying significantly more travel than they were initially designed to carry, is a critical component of a regional traffic congestion relief program. Additional lanes on one route also have been found to reduce congestion on nearby routes by drawing some of the traffic from these secondary roads.
- **New roads and highway links.** New urban highway links continue to be built in some urban areas and additional road capacity may be appropriate in some regions,

particularly where housing and job growth in a community have outstripped the level of service being provided by the current transportation system.

- **Additional transit service.** Increasing transit ridership can help relieve congestion, particularly along heavily-traveled corridors. Investment in additional transit that is convenient and affordable, can be an effective part of a regional congestion solution.
- **Install or improve sidewalks and bike paths.** Sidewalks and bike paths can provide an alternative to driving, particularly for shorter trips.

Improve the efficiency of the existing regional transportation system

- **Improved signalization.** Traffic speeds can be increased by 12 to 25 percent by using coordinated traffic signalization, thus improving traffic flow.
- **Improved incident management program.** Officials in many areas are improving the speed with which they can detect and respond to congestion-causing accidents and break-downs, thus reducing the time that traffic is delayed.
- **Improved driver information.** Regional transportation centers that provide drivers with current information on road conditions are having some success in reducing congestion.

- **Ramp-metering.** Highway ramps can be metered to insure that cars enter freeways more smoothly.

Reduce travel demand during peak hours

- **Promote telecommuting and flex-time.** Recent improvements in technology have greatly increased the ability of workers to telecommute, which, along with the increased use of flex-time, can contribute to reductions in some peak-hour highway travel, thus reducing regional traffic congestion.
- **Increase ridesharing and use of high-occupancy lanes.** Although carpooling diminished during the 1990s, the use and expansion of High Occupancy Vehicle (HOV) lanes can be effective in some metropolitan regions in allowing additional mobility on some highway corridors.

Conclusion

Congestion in Delaware has increased dramatically because the state has experienced significant population and travel growth in recent years. But the state's transportation facilities – its roads, freeways and transit system – have not been improved adequately. Offering traffic congestion relief, while accommodating additional travel will require that additional roadway capacity, largely additional lanes along existing routes, be part of the region's strategy to maintaining access and mobility.

Needed improvements must be made to the state's highway transportation system if Delaware's residents, visitors and businesses are to continue to enjoy sustained economic growth, a high quality of life and recreational activities. However, the state currently lacks adequate funding to provide for all needed highway and transit system expansions and improvements.

It is imperative that the state fund a transportation program that will relieve traffic congestion and maintain sufficient mobility to support personal travel, provide timely goods movement, reduce crashes, and meet the mobility needs of its residents, visitors and industries.

¹ Dunphy, R., “Moving Beyond Gridlock,” Urban Land Institute. 1997.

² Transportation Research Board, Special Report No. 245, “Expanding Metropolitan Highways: Implications for Air Quality and Energy Use, 1995. P. 217.

³ TRIP estimate based on U.S. Department of Transportation, Federal Highway Administration, Highway Statistics 2005: www.fhwa.dot.gov.

⁴ U.S. Department of Transportation, Federal Highway Administration, Highway Statistics 2005: www.fhwa.dot.gov.

⁵ Ibid.

⁶ Texas Transportation Institute. 2005 Urban Mobility Report.

⁷ *Building Roads to Reduce Traffic Congestion in America’s Cities: How Much and at What Cost?* Detailed State-by-State Analysis of Future Congestion and Capacity Needs. The Reason Foundation, 2006.

⁸ Ibid.

⁹ Schrank, D and Lomax, T., “2002 Urban Mobility Report,” Texas Transportation Institute, 2002, <http://mobility.tamu.edu>.