Keeping Maryland Mobile:

Accomplishments and Challenges in Improving Accessibility in Maryland to Support Quality of Life and a Strong Economy

TRIP
a national transportation research group

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

Executive Summary

Accessibility is a critical factor in a state's quality of life and economic competitiveness. The ability of people and businesses using multiple transportation modes to access employment, customers, commerce, recreation, education and healthcare in a timely fashion is critical for the development of a region and a state. Maryland's quality of life and economic development is being hampered by high levels of traffic congestion and reduced accessibility, but stands to benefit from a statewide program to improve accessibility in the Old Line State and could realize significant benefits from a proposal for an even more robust program to improve mobility.

TRIP's "Keeping Maryland Mobile" report examines the mobility and efficiency of the state's transportation system and improvements needed to enhance access.

TRAFFIC CONGESTION IN MARYLAND

High levels of traffic congestion on Maryland's major urban roads and highways reduce the reliability and efficiency of personal and commercial travel and hamper the state's ability to support economic development and quality of life.

- Maryland's major urban highways and roads ranked number one nationally in 2017 for the average amount of traffic carried daily per-lane-mile, and second nationally in average daily commute length from 2013 to 2017.

Rank	State	Average Daily Traffic Per Major Urban Lane Mile 2017	State	Average Daily Commute 2013-2017 (minutes)
1	**Maryland**	**10,962**	New York	33
2	California	10,103	**Maryland**	**32.7**
3	Delaware	9,701	New Jersey	31.5
4	New Jersey	9,626	Massachusetts	29.3
5	Minnesota	9,275	California	28.8

- The following chart shows the number of hours lost annually per average driver in the state's two largest urban areas and the per-driver cost of lost time and wasted fuel due to congestion in 2017.

Urban Area	Hours Lost to Congestion	Annual Cost Per Driver
Baltimore	50	$1,220
Washington, DC	87	$2,007

- In its 2017 state mobility report, the Maryland Department of Transportation State Highway Administration (MDOT SHA) estimates that congestion on the state's highways, freeways and major arterial roads costs the public $3.4 billion annually in the value of lost time and wasted fuel.

- A Center for Transportation Studies report found that, in 2017, of the approximately 1.9 million jobs accessible within a one-hour drive to residents of the Baltimore metro area, only 30 percent are accessible within a 30 minute drive. And, of the approximately 2.6 million jobs accessible within a one-hour drive to residents of the Washington, DC metro area, only 24 percent are accessible within a 30 minute drive.

- The Center for Transportation Studies report also found that, in 2017, the number of jobs accessible within a 40 minute drive in the Baltimore and Washington, DC metro areas during peak commuting hours was reduced by 38 and 47 percent, respectively, as a result of traffic congestion.

MARLAND'S MOST CONGESTED ROADWAYS

In its 2017 annual mobility report, MDOT SHA ranked the state's most congested sections of highways and most congested sections of arterial (non-freeway) roadways. Traffic congestion on these routes significantly reduces the reliability of travel times in these corridors.

- The following chart shows the most congested portions of Maryland highways during weekday AM and PM peak travel hours.

Rank	AM Most Congested Highway Sections		PM Most Congested Highway Sections	
	Route	Miles	Route	Miles
1	I-495 Outer Loop - US 1 to US 29	5	I-695 Inner Loop - MD 139 to MD 542	4.6
2	I-695 Outer Loop - I-795 to Edmondson Ave	7.5	I-270 West Spur Southbound - I-270 Split to I-495	2.1
3	I-695 Outer Loop - US 1 to MD 41	4.1	I-495 Inner Loop - Virginia State Line to I-270 West Spur	4
4	I-270 Local Southbound - Shady Grove Rd to Montrose Rd.	4.6	I-495 Outer Loop - MD 187 to Virginia State Line	5.3
5	I-95/I-495 Inner Loop - MD 5 to I-295	5.7	I-495 Inner Loop - MD 355 to MD 97	4.1
6	US 50 Westbound - MD 704 to MD 295	6.6	I-495 Inner Loop - MD 650 to MD 201	5.1
7	I-695 Inner Loop - MD 140 to I-83	5.4	I-270 Spur Northbound - I-495 to I-270	2.3
8	I-270 Southbound - Montrose Rd to I-270 Spur	3.1	MD 100 Westbound - MD 713 to US 1	2.8
9	MD 295 Southbound - MD 32 to MD 197	4.3	I-95/I-495 Inner Loop - MD 202 to MD 214	3.7
10	I-95 Southbound - MD 212 to I-495	2.1	I-695 Outer Loop - US 1 to MD 170	3.4
11	I-270 Southbound - MD 121 to Middlebrook Road	4.7	I-695 Inner Loop - US 1 to US 40	4.9
12	MD 295 Southbound MD 32 to AA/PG County Line	4.7	I-695 Inner Loop - US 40 to MD 26	5.8
12	MD 295 Southbound AA/PG County Line to MD 193	4.9	I-270 (Local) Northbound - Shady Grove Road to MD 124	5.4
14	I-95/I-495 Outer Loop MD 4 to US 50	8	I-95 Northbound - MD 216 to MD 100	7.1
15	I-97 Southbound MD 3 to MD 178	6.4	I-695 Outer Loop MD - 140 to US 40	7.5

- The following chart shows the most congested portions of Maryland arterial roadways during weekday AM and PM peak travel hours.

Rank	AM Most Congested Arterial Road Sections		PM Most Congested Arterial Roads Sections	
	Route	Miles	Route	Miles
1	US 29 Southbound - MD 650 to I-495	2.3	MD 210 Southbound - Kerby Hill Rd/Livingston Rd to Palmer Rd	2.0
2	MD 212 Westbound - Beltsville Dr to Riggs Rd	1.7	MD 650 Southbound - US 29 to Adelphi Rd	2.3
3	MD 185 Southbound - Jones Bridge Rd to Washington DC Line	1.7	MD 185 Northbound - MD 410 to 1-495	2.1
4	MD 210 Northbound - Swan Creek Rd	1.6	MD 28 Eastbound - E Gude Dr to Bel Pre Rd	2.6
5	MD 28 Westbound - MD 97 to E Gude	1.6	MD 410 Eastbound - Adelphi Rd to MD 295	2.4
6	MD 190 Eastbound - MD 188 to MD 614	1.6	MD 2 Northbound - US 50 to MD 648/Whites Rd	5.8
7	MD 3 Southbound - I-97 to Waugh Chapel Rd	1.6	MD 187 Northbound - MD 188 to I-495	2.5
8	MD 410 Westbound - MD 650 to US 29	1.6	MD 355 Northbound - Gude Dr to Shady Grove Rd	2.6
9	MD 97 Southbound - MD 193 to I-495	1.5	MD 3 Southbound - MD 175 to Waugh Chapel Rd	2.0
10	MD 650 Southbound - Venice Dr to I-495	1.5	MD 170 Southbound - MD 176 to MD 174	2.9
11	MD 27 Southbound - Oak Dr to Brink Rd	1.5	US 1 Northbound - MD 193 to Rhode Island Ave	2.1
12	MD 97 Southbound - MD 496 to MD 140	1.5	MD 115 Westbound - Needwood Rd to Shady Grove Rd	3.6
12	MD 185 Southbound - MD 97 to MD 193	1.5	MD 124 Northbound - Fieldcrest Rd to Brink Rd	2.0
14	MD 190 Eastbound - Stoney Creek Rd to Piney Meetinghouse Rd	1.5	US 1 Northbound - 38th St to Campus Dr/Paint Branch Dr	2.3
15	MD 28 Eastbound - Darnestown Rd to MD 355	1.5	MD 190 Westbound - I-495 to MD 189	3.3

POPULATION, ECONOMIC AND TRAVEL TRENDS IN MARYLAND

The rate of population and economic growth in Maryland has resulted in increased demands on the state's transportation system.

- Maryland's population reached approximately six million residents in 2018, a 14 percent increase since 2000. Maryland's population is expected to increase to approximately 6.9 million people by 2040 and the state is expected to add another 600,000 jobs by 2040.

- From 2000 to 2017, Maryland's gross domestic product (GDP), a measure of the state's economic output, increased by 45 percent, when adjusted for inflation and U.S. GDP increased by 37 percent .

- Vehicle miles traveled (VMT) in Maryland increased by 20 percent from 2000 to 2017 –from 50 billion VMT in 2000 to 60 billion VMT in 2017. The rate of vehicle travel growth in Maryland has accelerated since 2013, increasing by six percent between 2013 and 2017.

- By 2040, vehicle travel on I-495 and I-270 is expected to increase by 10 percent and 15 percent respectively.

- Travel on the InterCounty Connector, a 19-mile tolled highway from I-370 to US 1, which was opened in stages from 2011 to 2014, increased by 35 percent from 2014 to 2016, reaching a daily average of 50,900 vehicles.

FREIGHT TRANSPORTATION IN MARYLAND

Freight shipments in Maryland, which are primarily carried by trucks, are expected to increase significantly through 2040 due to population and economic growth, and changes in business, retail and consumer models, which rely on a faster and more responsive supply chain. The efficiency of freight movement in Maryland is threatened by traffic congestion, which reduces the reliability of goods movement to and from destinations in the state and through the state.

- Annually, $369 billion in goods are shipped to and from sites in Maryland, mostly by truck. Seventy-seven percent are carried by trucks and another 16 percent are carried by courier services or multiple mode deliveries, which include trucking.

- The value of freight shipped to and from sites in Maryland, in inflation-adjusted dollars, is expected to increase 110 percent by 2045.

- The following chart shows the five highway locations in Maryland carrying the largest number of large commercial trucks daily, and the five highway locations where large commercial trucks make up the largest share of daily traffic.

Rank	Highest Truck Volume		Highest Truck Percentage Locations	
	Route Location	Daily Trucks	Route Location	Percent
1	I-95 South of MD 175	28,400	US 301 South of Kent County Line	32%
2	I-95 North of MD 24	27,200	I-81 South of PA Line	32%
3	I-95 North of MD 100	27,200	I-81 South of US 11	32%
4	I-95/I-495 South of US 50	26,700	I-70 South of PA Line	31%
5	I-95 South of MD 24	26,500	I-68 West of US 219	30%

- The following chart details the highway segments in Maryland that provide the worst travel reliability for commercial trucks as a result of traffic congestion.

Rank	Least Reliable Routes for Large Commercial Trucks	Miles
1	I-895 Southbound - Moravia Road to Harbor Tunnel Toll Plaza	5
2	I-495 Inner Loop - I-270 - West Spur to MD 185	5.5
3	I-95/I-495 Inner Loop - MD 5 to I-295	5.7
4	I-70 Westbound - South Street to US 15/US 340	3
5	I-695 Outer Loop - MD 140 to MD 26	3.6
6	I-695 Outer Loop - I-95 to MD 147	4.3
7	I-95 Southbound - US 40 to Key Highway	6.2
8	1-270 East Spur Southbound - I-270 Split to I-495/MD 355	3.1
9	I-95 Northbound - Washington Blvd. to Fort McHenry Tunnel Toll Plaza	7.1
10	I-495 Outer Loop - MD 355 to Cabin John Parkway	6

- Highway accessibility was ranked the number one site selection factor in a 2017 survey of corporate executives by Area Development Magazine. Labor costs and the availability of skilled labor, which are both impacted by a site's level of accessibility, were rated second and third, respectively.

PROGRESS IN RELIEVING TRAFFIC CONGESTION IN MARYLAND

Using a combination of programs and projects, the MDOT SHA is addressing Maryland's traffic congestion and reliability challenges. These efforts are aimed at improving the efficiency and expanding the capacity of the state's transportation system.

- MDOT SHA congestion relief programs and projects to improve the efficiency and expand the capacity of the state's major roadways were estimated in 2016 to save approximately $1.6 billion in reduced delays, fuel consumption and emissions.

- MDOT SHA congestion relief efforts include: an incident management program that in 2016 cleared more than 30,000 incidents and assisted approximately 42,000 stranded motorists; improved traffic signalization; the provision of approximately 6,700 park and ride spaces at 106 locations; the use of High Occupancy Vehicle (HOV) lanes on portions of I-270 and US 50; the addition of nine miles of new sidewalks, 88 miles of marked bike lanes and six miles of shared use bike lanes; the addition of four new virtual freight weigh stations; the improvement of eight at-grade rail crossings; and, improvements to ten major intersections and the widening of a portion of MD 355 from Center Drive to West Cedar Lane in Montgomery County.

PROPOSED IMPROVEMENTS TO ENHANCE ACCESSIBILITY IN MARYLAND

Governor Larry Hogan has recommended a transportation plan designed to provide congestion relief, accommodate growth and improve economic development in Maryland. Using innovative design and funding methods, the goal of the plan is to improve the capacity, operations and safety of Maryland's transportation system.

- The $17.8 billion multimodal congestion relief plan includes:

✓ Widening of approximately 70 miles of Interstates in Maryland via funding provided through a public-private partnership, including I-495 from south of the American Legion Bridge to east of the Woodrow Wilson Bridge and I-270 from I-495 to I-70, including the east and west I-270 spurs.
✓ A traffic relief plan for portions of the Baltimore Beltway from I-70 to MD 43.
✓ An active traffic management program for I-95 from MD 32 to MD 100.
✓ The expansion of express toll lanes on I-95 from MD 43 to MD 24.
✓ The completion of the Purple Line from the Bethesda Metro Station to the New Carrollton Metro Station.
✓ Improvements to the BaltimoreLink transit system, the METRO system and the MARC system.
✓ A statewide expansion of the smart traffic signal program.

FEDERAL TRANSPORTATION FUNDING IN MARYLAND

Investment in Maryland's roads, highways and bridges is funded by local, state and federal governments. The current five-year federal surface transportation program includes modest funding increases and provides states with greater funding certainty, but falls far short of providing the level of funding needed to meet the nation's highway and transit needs. The bill does not include a long-term and sustainable revenue source.

- Most federal funds for highway and transit improvements in Maryland 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. Because revenue into the federal Highway Trust Fund has been inadequate to support legislatively set funding levels since 2008, 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.

Sources of information for this report include the Federal Highway Administration (FHWA), the Maryland Department of Transportation State Highway Administration (MDOT SHA), the American Association of State Highway and Transportation Official (AASHTO), the American Road and Transportation Builders Association (ARTBA), the Bureau of Transportation Statistics (BTS), the U. S. Census Bureau, the Center for Transportation Studies, the Texas Transportation Institute (TTI) and the National Highway Traffic Safety Administration (NHTSA). All data used in the report are the most recent available.

Introduction

Maryland's transportation system provides a vital link for the state's residents, visitors and businesses, providing daily access to homes, jobs, shopping, natural resources and recreation. An important measure of the adequacy of a state's transportation system is the level of access provided to residents, visitors and businesses. Accessibility is the ease of reaching valued destinations or being reachable from valued destinations. For the public, these destinations include jobs, housing, shopping, recreation and social outings, whereas for businesses these locations include customers, suppliers and employees.

Supporting quality of life and a robust economy in Maryland requires that the state provide an efficient transportation system that provides a high level of accessibility. But, the high level of traffic congestion in Maryland threatens the state's economic competitiveness and is impacting quality of life. Improving mobility in Maryland would enhance economic development opportunities, improve business productivity, and make it easier and more reliable for the public to get to and from valued destinations including work, home, school, shopping and social events.

Population, Travel and Economic Trends in Maryland

Maryland residents and businesses require a high level of personal and commercial mobility. Population increases and economic growth in the state have resulted in an increase in vehicle miles of travel (VMT) and an increased demand for mobility. To foster quality of life and spur continued economic growth in Maryland, it will be critical that the state provide a safe and modern transportation system that can accommodate future growth in population, tourism, business, recreation and vehicle travel.

Maryland's population grew to approximately six million residents in 2018, a 14 percent increase since 2000.[1] Maryland had 4.3 million licensed drivers in 2016.[2] Maryland's population is expected to increase to approximately 6.9 million by 2040 and the state is expected to add 600,000 jobs by 2040.[3]

From 2000 to 2017, Maryland's gross domestic product (GDP), a measure of the state's economic output, increased by 45 percent, when adjusted for inflation. U.S. GDP, adjusted for inflation, increased 37 percent during this period.[4]

From 2000 to 2017, annual VMT in Maryland increased by 20 percent, from approximately 50 billion miles traveled annually to approximately 60 billion miles traveled annually.[5] The rate of vehicle travel growth in Maryland has accelerated since 2013, increasing by six percent between 2013 and 2017.[6] Continued population and economic growth are expected to result in further increases in vehicle travel on the state's most heavily traveled highways. By 2040, vehicle travel on I-495 and I-270 is expected to increase by 10 percent and 15 percent, respectively.[7]

Vehicle travel on the InterCounty Connector, a 19-mile tolled highway from I-370 to US 1, which was opened in stages from 2011 to 2014, increased by 35 percent from 2014 to 2016, reaching a daily average of 50,900 vehicles.[8]

Cost of Congestion in Maryland

Significant levels of traffic congestion on Maryland's major urban highways and roads hamper the state's ability to support economic development and quality of life by reducing the reliability and efficiency of personal and commercial travel, including the transport of goods and services. Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to consumers. Increased levels of congestion can also reduce the attractiveness of a location when a company is considering expansion or deciding where to locate a new facility.

Maryland's major urban highways and roads ranked number one nationally in 2017 for the average amount of traffic per-lane-mile, carrying an average of 10,962 vehicles per day.[9] Estimates from the 2013-2017 American Community Survey also indicate that, at 32.7 minutes, Maryland is second only to New York State (33 minutes) in average commute lengths.[10] The average national commute is 26.4 minutes.

Chart 1. States with greatest average daily traffic per lane-mile on major urban highway and roads; states with longest average commute.

Rank	State	Average Daily Traffic Per Major Urban Lane Mile 2017	State	Average Daily Commute 2013-2017 (minutes)
1	**Maryland**	**10,962**	New York	33
2	California	10,103	**Maryland**	**32.7**
3	Delaware	9,701	New Jersey	31.5
4	New Jersey	9,626	Massachusetts	29.3
5	Minnesota	9,275	California	28.8

Source: Federal Highway Administration; United States Census Bureau, American Community Survey

In its 2017 state mobility report, the Maryland Department of Transportation State Highway Administration (MDOT SHA) estimates that congestion costs on the state's highways, freeways and major arterial roads is $3.4 billion annually in the value of lost time and wasted fuel.[11]

Traffic congestion in Maryland is greatest in the Baltimore metro area and the suburbs of the Washington, D.C. metro area. Based on methodology developed by the Texas Transportation Institute, which analyzes urban traffic congestion, TRIP estimated the amount of time and the value of lost time and wasted fuel as a result of traffic congestion in 2017 for the average driver in the Baltimore and Washington, D.C., metropolitan areas. The chart below shows the average number of hours lost annually for each driver in the state's two largest urban areas, and the per-driver cost of lost time and wasted fuel due to congestion.

Chart 2. Annual hours lost to congestion and congestion costs per driver.

Urban Area	Hours Lost to Congestion	Annual Cost Per Driver
Baltimore	50	$1,220
Washington, DC	87	$2,007

Source: TRIP estimates based on Texas Transportation Institute methodology.

Traffic congestion significantly reduces access to jobs and employees. In a 2017 report, the Center for Transportation Studies at the University of Minnesota analyzed accessibility to jobs in private vehicles in the largest 50 urban areas in the U.S. The report found that of the approximately 1.9 million jobs accessible within a one-hour drive to a resident of the Baltimore metro area, only 30 percent are accessible within 30 minutes. Of the approximately 2.6 million jobs accessible within a one-hour drive to a resident of the Washington, DC metro area, only 24 percent are accessible within a 30 minute drive.[12]

The Center for Transportation Studies report also looked at the impact of traffic congestion on reducing accessibility to employment by comparing travel times during peak hours versus non-peak hours. The report found that the number of jobs accessible within 40 minutes during peak commuting times in the Baltimore and Washington, DC metro areas was reduced by 38 and 47 percent, respectively, as a result of traffic congestion.[13]

Maryland's Most Congested Roadways

In its 2017 annual mobility report, MDOT SHA ranked the state's most congested sections of highways and most congested sections of arterial (non-freeway) roadways. Traffic congestion on these routes reduces significantly the reliability of travel times in these corridors.

The following chart shows the most congested portions of Maryland highways during weekday AM and PM peak travel hours.

Chart 3. Most Congested Sections of Maryland Highways During AM and PM Peak Travel Hours.

Rank	AM Most Congested Highway Sections		PM Most Congested Highway Sections	
	Route	Miles	Route	Miles
1	I-495 Outer Loop - US 1 to US 29	5	I-695 Inner Loop - MD 139 to MD 542	4.6
2	I-695 Outer Loop - I-795 to Edmondson Ave	7.5	I-270 West Spur Southbound - I-270 Split to I-495	2.1
3	I-695 Outer Loop - US 1 to MD 41	4.1	I-495 Inner Loop - Virginia State Line to I-270 West Spur	4
4	I-270 Local Southbound - Shady Grove Rd to Montrose Rd.	4.6	I-495 Outer Loop - MD 187 to Virginia State Line	5.3
5	I-95/I-495 Inner Loop - MD 5 to I-295	5.7	I-495 Inner Loop - MD 355 to MD 97	4.1
6	US 50 Westbound - MD 704 to MD 295	6.6	I-495 Inner Loop - MD 650 to MD 201	5.1
7	I-695 Inner Loop - MD 140 to I-83	5.4	I-270 Spur Northbound - I-495 to I-270	2.3
8	I-270 Southbound - Montrose Rd to I-270 Spur	3.1	MD 100 Westbound - MD 713 to US 1	2.8
9	MD 295 Southbound - MD 32 to MD 197	4.3	I-95/I-495 Inner Loop - MD 202 to MD 214	3.7
10	I-95 Southbound - MD 212 to I-495	2.1	I-695 Outer Loop - US 1 to MD 170	3.4
11	I-270 Southbound - MD 121 to Middlebrook Road	4.7	I-695 Inner Loop - US 1 to US 40	4.9
12	MD 295 Southbound MD 32 to AA/PG County Line	4.7	I-695 Inner Loop - US 40 to MD 26	5.8
12	MD 295 Southbound AA/PG County Line to MD 193	4.9	I-270 (Local) Northbound - Shady Grove Road to MD 124	5.4
14	I-95/I-495 Outer Loop MD 4 to US 50	8	I-95 Northbound - MD 216 to MD 100	7.1
15	I-97 Southbound MD 3 to MD 178	6.4	I-695 Outer Loop MD - 140 to US 40	7.5

Source: Maryland Department of Transportation State Highway Administration

The following chart indicates the most congested portions of Maryland arterial (non-highway) roadways during weekday AM and PM peak travel hours.

Chart 4. Most Congested Sections of Maryland Arterial Roadways During AM and PM Peak Travel Hours.

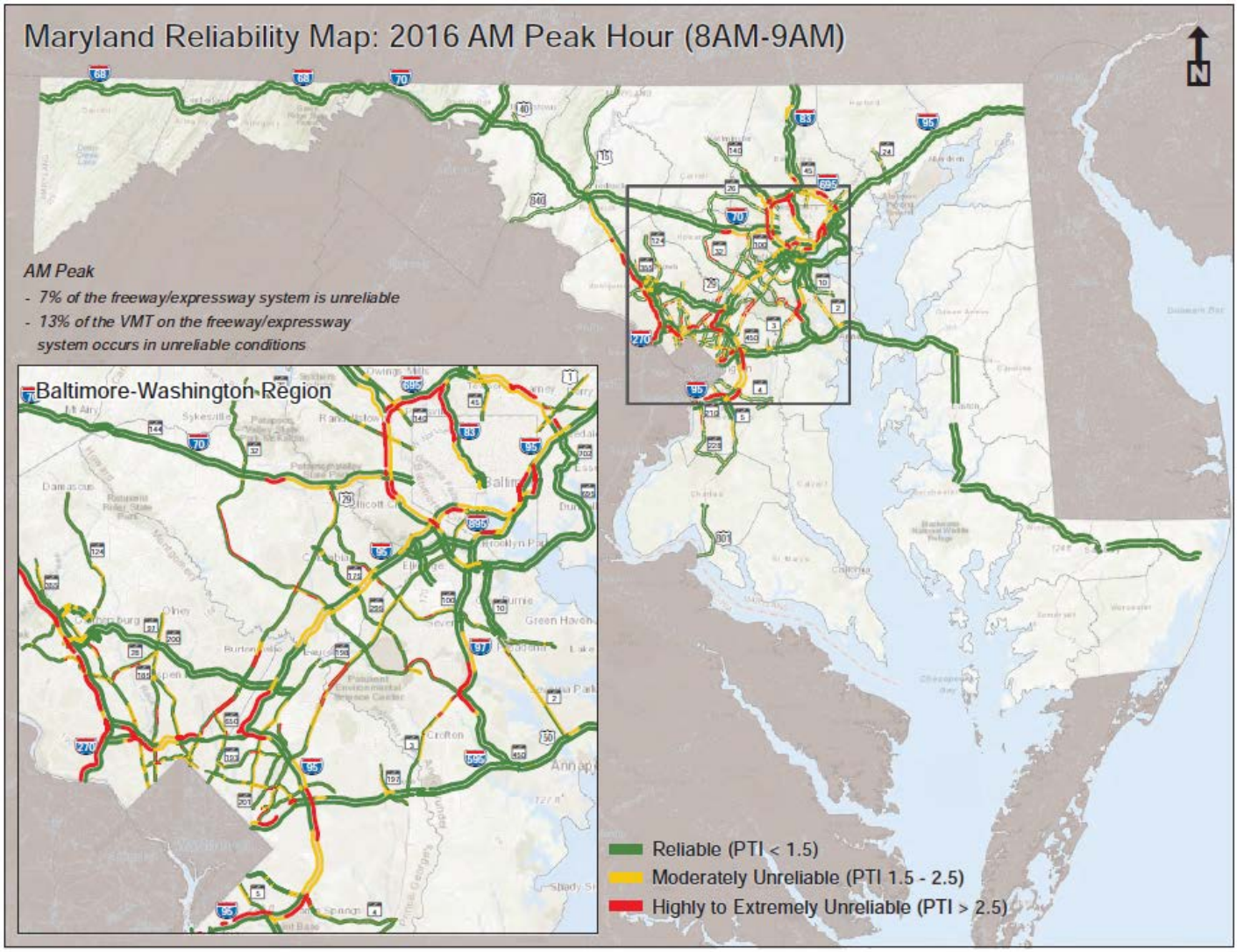
Rank	AM Most Congested Arterial Road Sections		PM Most Congested Arterial Roads Sections	
	Route	Miles	Route	Miles
1	US 29 Southbound - MD 650 to I-495	2.3	MD 210 Southbound - Kerby Hill Rd/Livingston Rd to Palmer Rd	2.0
2	MD 212 Westbound - Beltsville Dr to Riggs Rd	1.7	MD 650 Southbound - US 29 to Adelphi Rd	2.3
3	MD 185 Southbound - Jones Bridge Rd to Washington DC Line	1.7	MD 185 Northbound - MD 410 to 1-495	2.1
4	MD 210 Northbound - Swan Creek Rd	1.6	MD 28 Eastbound - E Gude Dr to Bel Pre Rd	2.6
5	MD 28 Westbound - MD 97 to E Gude	1.6	MD 410 Eastbound - Adelphi Rd to MD 295	2.4
6	MD 190 Eastbound - MD 188 to MD 614	1.6	MD 2 Northbound - US 50 to MD 648/Whites Rd	5.8
7	MD 3 Southbound - I-97 to Waugh Chapel Rd	1.6	MD 187 Northbound - MD 188 to I-495	2.5
8	MD 410 Westbound - MD 650 to US 29	1.6	MD 355 Northbound - Gude Dr to Shady Grove Rd	2.6
9	MD 97 Southbound - MD 193 to I-495	1.5	MD 3 Southbound - MD 175 to Waugh Chapel Rd	2.0
10	MD 650 Southbound - Venice Dr to I-495	1.5	MD 170 Southbound - MD 176 to MD 174	2.9
11	MD 27 Southbound - Oak Dr to Brink Rd	1.5	US 1 Northbound - MD 193 to Rhode Island Ave	2.1
12	MD 97 Southbound - MD 496 to MD 140	1.5	MD 115 Westbound - Needwood Rd to Shady Grove Rd	3.6
12	MD 185 Southbound - MD 97 to MD 193	1.5	MD 124 Northbound - Fieldcrest Rd to Brink Rd	2.0
14	MD 190 Eastbound - Stoney Creek Rd to Piney Meetinghouse Rd	1.5	US 1 Northbound - 38th St to Campus Dr/Paint Branch Dr	2.3
15	MD 28 Eastbound - Darnestown Rd to MD 355	1.5	MD 190 Westbound - I-495 to MD 189	3.3

Source: Maryland Department of Transportation State Highway Administration

Travel time on roadways can vary due to several non-recurring events, including traffic levels, vehicle breakdowns, traffic crashes or poor weather. Because congested roadways are more vulnerable to delays as a result of non-recurring events, travel time on these routes can vary significantly, diminishing the reliability of travel on these routes.

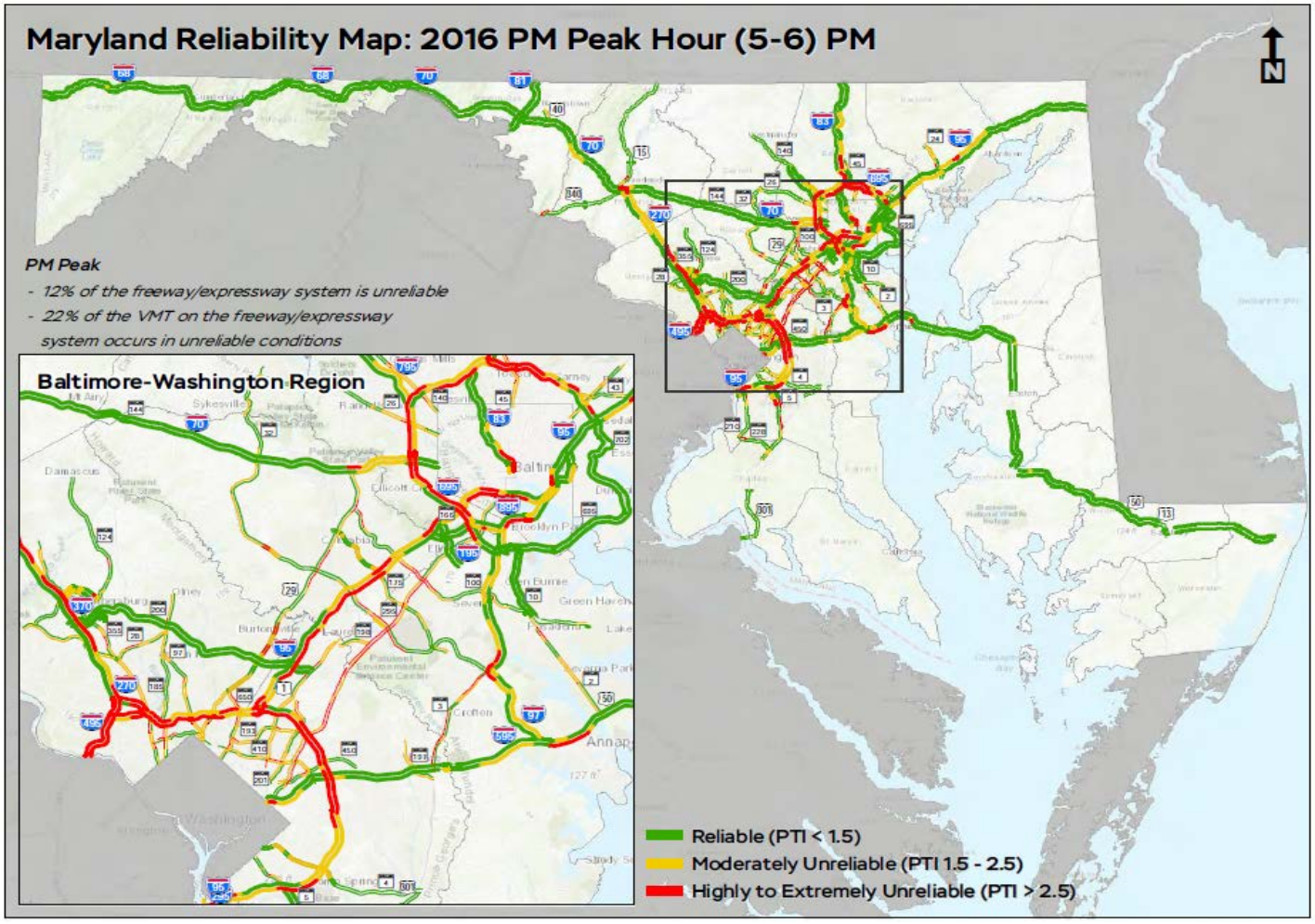
In the following two charts, MDOT SHA rates the reliability of travel on the state's highways during weekday morning and weekday afternoon peak period travel.

Chart 5. Reliability Levels on Maryland Highways During AM Peak Hours



Source: Maryland Department of Transportation State Highway Administration

Chart 6. Reliability Levels on Maryland Highways During PM Peak Hours



Source: Maryland Department of Transportation State Highway Administration

Progress in Relieving Traffic Congestion in Maryland

Using a combination of programs and projects, the MDOT SHA is addressing Maryland's traffic congestion and travel reliability challenges. These efforts include programs and projects aimed to improve the efficiency and expand the capacity of the state's transportation system and in 2016 were estimated to save the state approximately $1.6 billion in reduced delays, fuel consumption and emissions.

These programs include:

Incident management: In 2016 the state's Coordinated Highways Action Response Team (CHART) cleared more than 30,000 traffic incidents and assisted approximately 42,000 stranded motorists.

Improved traffic signalization: In 2016, MDOT SHA re-timed 202 traffic signals and completed an adaptive traffic signal system on MD 24.

Park and ride lots: MDOT SHA maintains more than 6,700 park and ride lots at 106 locations in 20 counties to connect private vehicle commuters to transit.

HOV lanes: HOV lanes are provided on portions of I-270 and US 50 to increase the number of people able to travel through these corridors.

Pedestrian and bike facilities: MDOT SHA provided an additional nine miles of new sidewalks, 88 miles of marked bike lanes and six miles of marked shared use bike lanes in 2016.

Improved freight movement: Four new virtual weigh stations, improvements to eight at-grade rail crossings and initial design work for ten additional truck parking spaces on I-70 westbound at South Mountain were completed in 2016.

Additional capacity: MDOT SHA continues to provide additional roadway capacity at a number of intersections and portions of roadways, including the following in 2016: US 220 at Louise Drive, MD 2 at MD 255, MD 2 at Earleigh Heights Road/Magothy Bridge Road, MD 32 at MD 97, MD 140 at Pleasant Valley Road South, MD 22 at Old Post Road, MD 119 at Orchard Ridge Drive/Kentlands Boulevard, the construction of a new interchange on MD 5 to improve access to the Branch Avenue Metro Station, and widening along MD 355 between Center Drive and West Cedar Lane.

Freight Transportation in Maryland

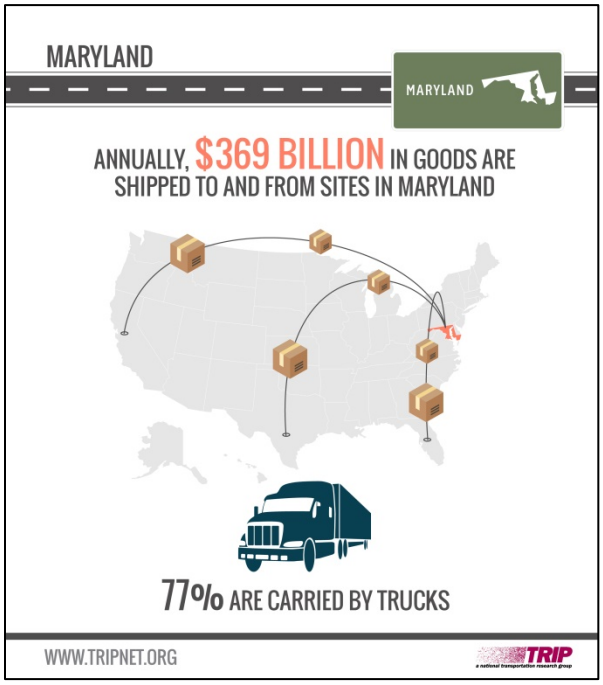
Evolving business and retail models that rely on leaner supply chains, advances in warehouse and supply chain automation, the significant growth in e-commerce, increasing international trade, and the growing logistic networks being developed by Amazon and other large retailers, require timely and reliable freight shipments.

Digitization is resulting in significant improvements in supply chain management, allowing freight brokers, carriers, shippers and receivers to exchange real-time data to more efficiently utilize freight capacity.

In response to the need for more efficient goods movement in the Northeast, numerous warehouse developments have occurred along the I-95 corridor in Maryland, including a one-million square foot distribution center southeast of Baltimore opened by Amazon in 2015.[14]

Highways are vitally important to continued economic development in Maryland, particularly to the state's manufacturing, agriculture and tourism industries. 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, $369 billion in goods are shipped to and from sites in Maryland, mostly by trucks.[15] Seventy-seven percent of the goods shipped annually to and from sites in Maryland are carried by trucks and another 16 percent are carried by courier services or multiple-mode deliveries, which include trucking.[16] The amount of freight shipped in Maryland is expected to more than double over the next 25 years. The value of freight shipped to and from sites in Maryland, in inflation-adjusted dollars, is expected to increase by 110 percent by 2045.[17]



The following chart shows the five highway locations in Maryland carrying the largest number of large commercial trucks daily, and the five highway locations where the greatest share of overall traffic is made up of large commercial trucks.

Chart 7. Highest Maryland Truck Volume and Percentage Locations

Rank	Highest Truck Volume		Highest Truck Percentage Locations	
	Route Location	Daily Trucks	Route Location	Percent
1	I-95 South of MD 175	28,400	US 301 South of Kent County Line	32%
2	I-95 North of MD 24	27,200	I-81 South of PA Line	32%
3	I-95 North of MD 100	27,200	I-81 South of US 11	32%
4	I-95/I-495 South of US 50	26,700	I-70 South of PA Line	31%
5	I-95 South of MD 24	26,500	I-68 West of US 219	30%

Source: Maryland Department of Transportation State Highway Administration

The efficiency of freight movement in Maryland is threatened by traffic congestion, which reduces the reliability of goods movement to and from destinations in the state as well as through the state. The following chart details the highway segments in Maryland that provide the worst travel reliability for commercial trucks as a result of traffic congestion.

Chart 8. Least Reliable Highway Routes for Large Commercial Trucks Due to Traffic Congestion

Rank	Least Reliable Routes for Large Commercial Trucks	Miles
1	I-895 Southbound - Moravia Road to Harbor Tunnel Toll Plaza	5
2	I-495 Inner Loop - I-270 - West Spur to MD 185	5.5
3	I-95/I-495 Inner Loop - MD 5 to I-295	5.7
4	I-70 Westbound - South Street to US 15/US 340	3
5	I-695 Outer Loop - MD 140 to MD 26	3.6
6	I-695 Outer Loop - I-95 to MD 147	4.3
7	I-95 Southbound - US 40 to Key Highway	6.2
8	1-270 East Spur Southbound - I-270 Split to I-495/MD 355	3.1
9	I-95 Northbound - Washington Blvd. to Fort McHenry Tunnel Toll Plaza	7.1
10	I-495 Outer Loop - MD 355 to Cabin John Parkway	6

Source: Maryland Department of Transportation State Highway Administration

The cost of road and bridge improvements is more than offset by the reduction of user costs associated with driving on rough roads, the improvement in business productivity, the reduction in delays and the improvement in traffic safety.

Local, regional and state economic performance is improved when a region's surface transportation system is expanded or repaired. This improvement comes as a result of the initial job creation and increased employment created over the long-term because of improved access, reduced transport costs and improved safety.

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 2017 survey of corporate executives by Area Development Magazine. Labor costs and the availability of skilled labor, which are both impacted by a site's level of accessibility, were rated second and third, respectively.[18]

Improvements Proposed to Enhance Accessibility in Maryland

Addressing Maryland significant traffic congestion challenges will require investment in projects that can provide additional capacity along some of the state's most heavily traveled highway and transit corridors and further investment in projects that improve the efficiency of the state's transportation system.

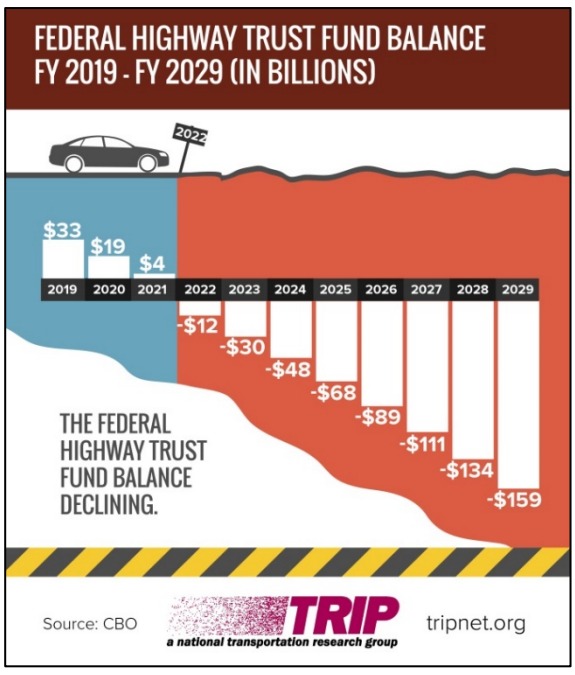
Maryland Governor Larry Hogan has recommended a transportation plan designed to provide congestion relief, accommodate growth and prosperity in Maryland. Using innovative design and funding methods, the goal of the plan is to improve the capacity, operations and safety of Maryland's transportation system.

The $17.8 billion multimodal, congestion relief plan includes:

- Widening of approximately 70 miles of Interstates in Maryland with funding provided though public-private partnerships, including the following: I-495 from south of the American Legion Bridge to east of the Woodrow Wilson Bridge and I-270 from I-495 to I-70, including the east and west I-270 spurs.
- A traffic relief plan for portions of the Baltimore Beltway from I-70 to MD 43.
- An active traffic management program for I-95 from MD 32 to MD 100.
- The expansion of express toll lanes on I-95 from MD 43 to MD 24.
- The completion of the Purple Line from the Bethesda Metro Station to the New Carrollton Metro Station.
- Improvements to the BaltimoreLink transit system, the METRO system and the MARC system.
- A statewide expansion of the smart traffic signal program.

Federal Transportation Funding

Investment in Maryland'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. The federal government is a critical source of funding for Maryland's roads, highways, bridges and transit systems and provides a significant return in road and bridge funding based on the revenue generated in the state by the federal motor fuel tax.



Most federal funds for highway and transit improvements in Maryland 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. Because revenue into the federal Highway Trust Fund has been inadequate to support legislatively set funding levels since 2008, 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.[19]

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

The five-year, $305 billion FAST Act will provide a boost of approximately 15 percent in highway funding and 18 percent in transit funding over the duration of the program, which expires in 2020.[20] In addition to federal motor fuel tax revenues, the FAST Act will also be funded by $70 billion in U.S. general funds, which will rely on offsets from several unrelated federal programs including the Strategic Petroleum Reserve, the Federal Reserve and U.S. Customs.

Conclusion

As Maryland strives to enhance its high performance economy, it will be critical that it is able to provide a well-maintained, safe and efficient 21st century network of roads, highways, bridges and transit that can accommodate the mobility demands of a modern society.

With the heaviest traveled major urban roadways in the country, the second-longest average commute in the nation, and as home to two of the most heavily congested urban areas in the nation, it is critical that Maryland have a robust transportation plan capable of improving mobility and accessibility, which is vital to the state's residents, businesses and visitors.

# # #

ENDNOTES

[1] U.S. Census Bureau (2018).
[2] Highway Statistics (2016). Federal Highway Administration. DL-1C
[3] Maryland Department of Transportation State Highway Administration (2018) 2017 Maryland State Highway Mobility Report. P. I.A.4. https://www.roads.maryland.gov/OPPEN/2017_Mobility_Report.pdf
[4] Bureau of Economic Analysis (2019).
[5] U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2000 and 2017.
[6] U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2013 and 2017.
[7] Maryland Department of Transportation, State Highway Administration (2018). Traffic Relief Plan. https://www.roads.maryland.gov/Index.aspx?PageId=580
[8] Maryland Department of Transportation State Highway Administration (2018). 2017 Maryland State Highway Patrol Report. https://www.roads.maryland.gov/OPPEN/2017_Mobility_Report.pdf P. II.B.21
[9] Federal Highway Administration (2018). Highway Statistics 2017. TRIP analysis of table HM-62. https://www.fhwa.dot.gov/policyinformation/statistics/2017/
[10] United States Census Bureau (2019). Mean travel time tow work (minutes), workers 16 years+. https://www.census.gov/search-results.html?q=commute&page=1&stateGeo=none&searchtype=web&cssp=SERP&_charset_=UTF-8
[11] Maryland Department of Transportation State Highway Administration (2018). 2017 Maryland State Highway Patrol Report. https://www.roads.maryland.gov/OPPEN/2017_Mobility_Report.pdf
[12] Center for Transportation Studies, University of Minnesota (2018). Access Across America: Auto 2017. http://access.umn.edu/research/america/auto/2017/
[13] Ibid.
[14] Maryland Department of Transportation State Highway Administration (2018). 2017 Maryland State Highway Patrol Report. https://www.roads.maryland.gov/OPPEN/2017_Mobility_Report.pdf P. I.C.2
[15] TRIP analysis of Bureau of Transportation Statistics, U.S. Department of Transportation. 2012 Commodity Flow Survey, State Summaries.
[16] Ibid.
[17] TRIP analysis of the Federal Highway Administration's Freight Analysis Framework. (2018). https://faf.ornl.gov/fafweb/
[18] Area Development Magazine (2018). 32nd Annual Survey of Corporate Executives: Availability of Skilled Labor New Top Priority. http://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2018/32nd-annual-corporate-survey-14th-annual-consultants-survey.shtml
[19] "Surface Transportation Reauthorization and the Solvency of the Highway Trust Fund," presentation by Jim Tymon, American Association of State Highway and Transportation Officials (2014).
[20] 2015 "Fixing America's Surface Transportation Act." (2015) American Road and Transportation Builders Association. http://www.artba.org/newsline/wp-content/uploads/2015/12/ANALYSIS-FINAL.pdf