

Chapter 5: Project Impacts

5.1: Financial Plan for the NOACA Region

Introduction

AIM Forward 2040 identifies and prioritizes needed investments for maintaining, operating, and improving the region's multimodal transportation network through the year 2040. The Plan needs to include a financial plan that compares the cost of implementing the Plan recommendations with anticipated revenue through the year 2040. The Plan is "fiscally constrained" when the total costs of implementing the Plan are within anticipated revenue projections.

NOACA must demonstrate that there are reasonably available financial resources to complete the plan of projects between now and 2040. The financial plan demonstrates that *AIM Forward 2040* is fiscally constrained, meaning that projects contained in the transportation plan cannot exceed the amount of funding "reasonably expected to be available" during the life of the plan. The financial plan outlines a vision and strategy for how funding expected to be available will be expended for maintenance and operations.

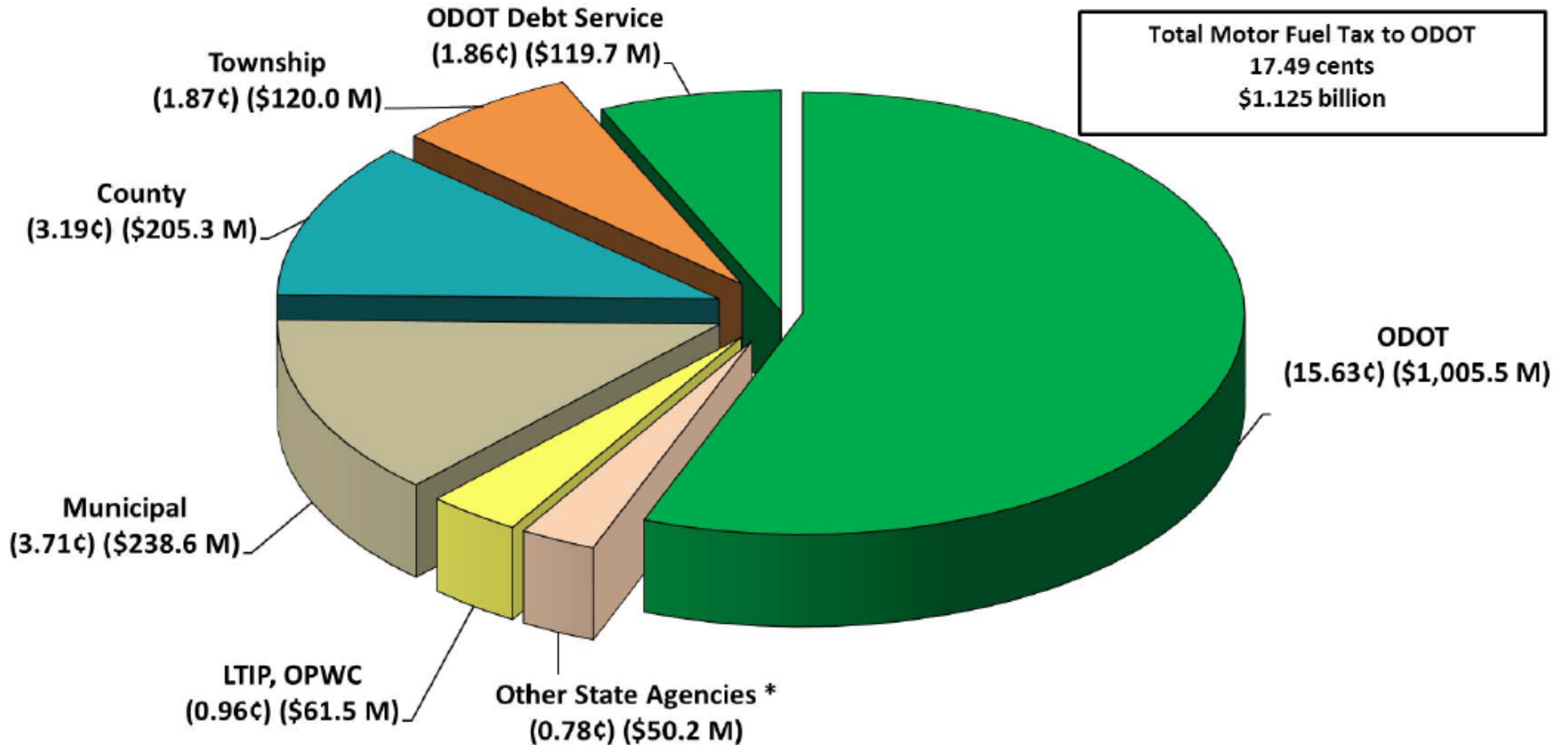
Transportation Funding Sources

The majority of funding generated to support transportation operations and maintenance projects in the *AIM Forward 2040* plan are sourced through federal and state motor fuel tax revenues. On the federal level, the current Fixing America's Surface Transportation Act (FAST Act) apportions funding to the state from the Highway Trust Fund, made up primarily of federal motor fuel tax revenues (currently 18.4¢ per gallon) and supplemented with transfers from the general fund and the Leaking Underground Storage Tank Trust Fund (a separate trust fund set up for certain environmental cleanup purposes, which is financed with a small portion of motor fuel taxes) to keep it solvent. FAST Act was signed into law on December 4, 2015. It represents the first federal law in more than a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorized \$305 billion nationwide over fiscal years 2016 through 2020 for highway and public transportation investments. The FAST Act provided increased funding levels over those of the previous MAP-21 reauthorization bill. During the life of the FAST Act, funding is projected to increase annually by an average of 2% for highway and 1% for public transportation spending.¹³¹

On the state level, revenues generated through the motor fuel tax (currently 28.0¢ per gallon) are collected and distributed by law to state and local governments for transportation-related investments. As illustrated in the graph in Figure 5.1-1, ODOT receives a majority of the funding at 17.49¢ (63%), while municipalities receive 3.71¢ (13%), counties receive 3.19¢ (11%), townships receive 1.87¢ (7%), Ohio Public Works Commission receives 0.96¢ (3%), and other state agencies receive 0.78¢ (3%). Funds distributed to local governments are often committed as matching funds to federal- or state-funded projects in the Plan and Transportation Improvement Program (TIP). All federal, state, and local funds that are reasonably expected to be available are described in the subsequent sections of this chapter.

¹³¹ Fixing America's Surface Transportation Act or "FAST Act," A Summary of Highway Provisions, Office of Policy and Governmental Affairs, July 2016.

Figure 5.1-1: Ohio Motor Fuel Tax Distribution
OHIO MOTOR FUEL TAX - \$0.28 / Gallon
FY 2016 DISTRIBUTION - \$1,800,843,039



(*) ODNR; PUCO; Dept. of Taxation; Turnpike Commission; Development Services; Inspector General; Governor's Energy Office.

Source: ODOT Revenue and Budget Forecast presentation, OTEC 2016, October 27, 2016.
http://www.dot.state.oh.us/engineering/OTEC/2016%20Presentations/Wednesday/Closing-P1/Winning_P1.pdf

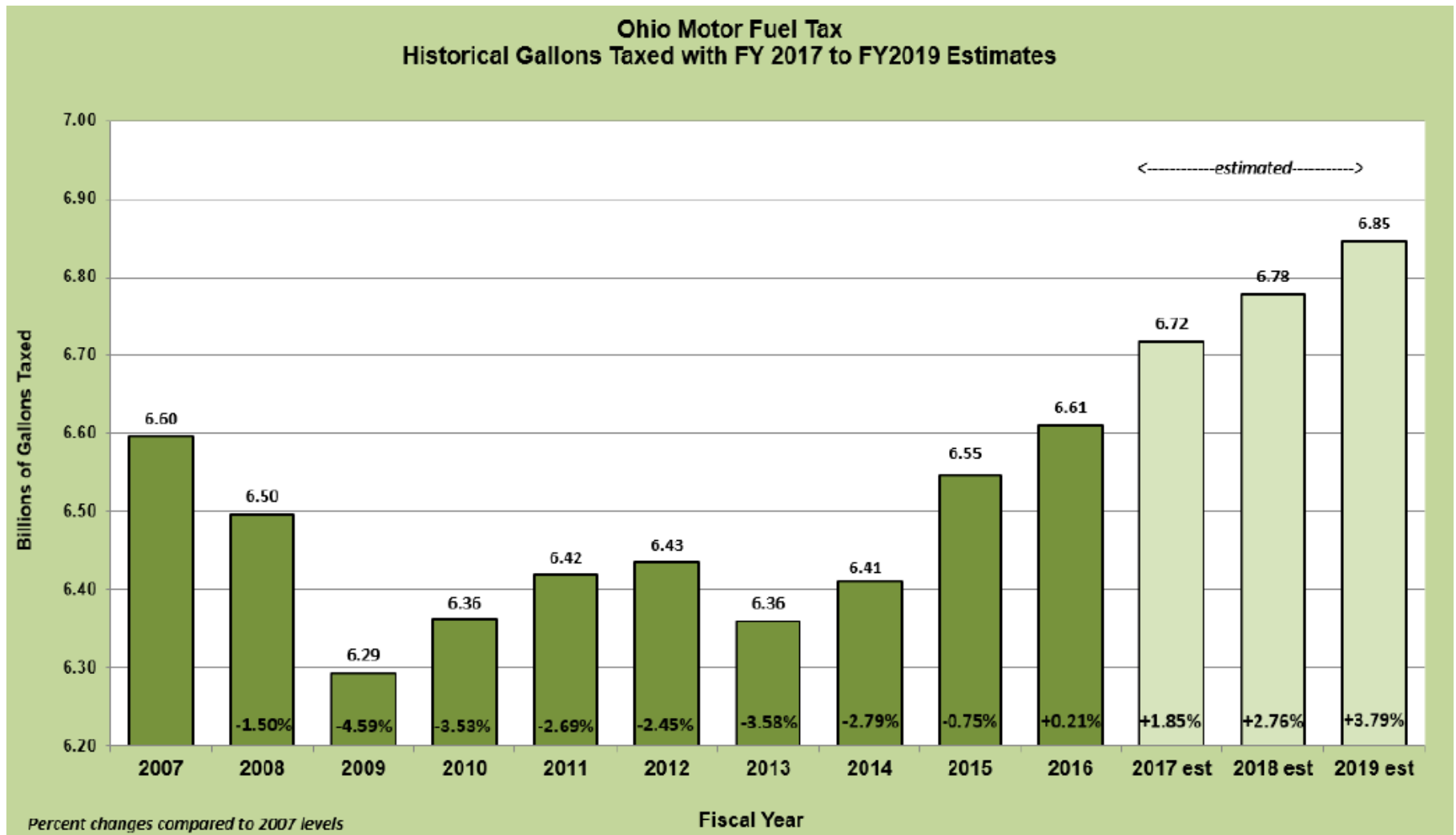
Highway Funding

Transportation funding invested in the NOACA region comes from various federal, state, and local funding sources. Funds are made available through multiple programs for roadway construction and other multimodal projects. Non-NOACA administered funds allocated through ODOT include:

- **National Highway Performance Program (NHPP) - Federal.** This program provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a state's asset management plan for the NHS.
- **Surface Transportation Block Grant Program (STBG) - Federal.** The Surface Transportation Block Grant Program (STBG) provides flexible funding that may be used by states and localities for projects to preserve and improve the conditions and performance on any federal-aid highway, bridge, and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. ODOT-controlled STBG funding is used primarily for state-maintained roadways. STBG funds are also allocated to the ODOT Urban Paving Program to support maintenance of state and U.S. routes within municipalities.
- **Congestion Mitigation Air Quality (CMAQ) - Federal.** CMAQ provides flexible funding to the state for transportation projects and programs to help meet the requirements of the Clean Air Act. ODOT retains CMAQ funds that it uses to fund eligible highway projects, programs that assist transit agencies with capital projects, and a Diesel Emissions Reduction Grant (DERG) program administered in partnership with Ohio EPA. Approximately 70% of the state's CMAQ apportionment is allocated to MPOs in maintenance or non-attainment areas to advance air quality programs and projects as described below under NOACA-administered funding sources.
- **Highway Safety Improvement Program (HSIP) - Federal.** The HSIP is a core federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads, including non-state-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance.
- **Motor Fuel Tax (MTF) – State.** The primary source of state funding used by ODOT is generated from the state MFT. The total funding generated in 2016 through the state MFT was \$1.8 billion, of which \$1.125 billion was allocated to ODOT for distribution to transportation projects. The primary uses of state MFT funding by ODOT is to match federal funding, pay down debt service, and for non-federal-aid-eligible project activities. Local and Ohio Public Works Commission (OPWC) portions of the state MTF are presented below under local sources.

Although the state MFT has not been increased since 2006, revenue generated since 2013 has increased and is projected to continue to increase through 2019, due to higher vehicle miles traveled and gallons of fuel taxed. As VMT increases, more gallons of gas are consumed and taxed. Figure 5.1-2 illustrates the historic gallons of fuel taxed and estimates for 2017 through 2019. As a result, ODOT estimates a 1% growth in funding for those years.

Figure 5.4-2: Ohio Motor Fuel Tax Historic Gallons Taxed.



Source: ODOT Revenue and Budget Forecast presentation, OTEC 2016, October 27, 2016.
http://www.dot.state.oh.us/engineering/OTEC/2016%20Presentations/Wednesday/Closing-P1/Winning_P1.pdf

Federal and State highway funds through ODOT are distributed through a variety of programs that target specific needs and geographies. ODOT programs eligible for highway projects in the NOACA region are shown in Figure 5.1-3.

Figure 5.1-3: ODOT Programs eligible for Highway Projects

Program Name	Primary Funding Source(s)	Target
District Preservation	STBG / NHPP / State	Rehabilitation of ODOT maintained roadways and bridges
District Maintenance	STBG / NHPP / State	Preventative maintenance of ODOT maintained roadways and bridges
Urban Paving	STBG	Resurfacing of State and U.S. routes within municipal corporations
Municipal Bridge	STBG	Rehabilitation of municipally owned bridges
Local Major Bridge	STBG	Rehabilitation of local government owned bridges that are greater than 35,000 deck area, or that are lift or movable structure types
County Bridge	STBG	Rehabilitation of county owned bridges
County STP	STBG	Rehabilitation of county maintained roadways
County Safety	HSIP / State	Improved safety on county maintained roadways
Transportation Review Advisory Council (TRAC) – Major New	Multiple, based on funding available after preservation goals achieved	Projects over \$12 million which accomplish one or more of the following: increase mobility, provide connectivity, increase the accessibility of a region for economic development, increase the capacity of a transportation facility, or reduce congestion.
Major Bridge	STBG / NHPP	Established to help alleviate the high cost of major bridge projects previously funded by the individual District Preservation programs.
Major Rehabilitation	STBG / NHPP	Rehabilitation projects along the multi-lane divided priority system (interstate or interstate look alike) which restores the structural integrity of the pavement and/or the bridges
Safety	HSIP / State	Improved safety on all roadways
Safe Routes to School	STBG set aside (formerly TAP)	Provides funds for projects that support walking or bicycling to school for grades K-8.
Source: ODOT Program Resource Guide, 2016. http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Documents/ODOT%20Program%20Resource%20Guide.pdf		

ODOT is responsible for the management and forecasting of the funds expected to be available from the above sources. NOACA, however, has direct control over several funds. Every year

NOACA receives an allocation of federal STBG and STBG set-aside funds [formerly the federal Transportation Alternatives Program (TAP)] through ODOT for highway and transportation alternatives projects. These funds are controlled by NOACA and allocated through NOACA's project selection process. CMAQ funds for the eight large MPOs in Ohio (more than 200,000 population) are administered by the Ohio Association of Regional Councils (OARC). The MPOs collectively establish, prioritize, and manage the annual programs of CMAQ projects.

NOACA generally administers approximately \$50 million of federal-aid funding each year. In addition to revenue sources from ODOT and Federal Highway Administration (FHWA), NOACA can influence local investments used to match federal funds and state funds through its project selections.

The NOACA-administered funding sources used for highway projects include:

- **NOACA CMAQ - Federal.** CMAQ provides flexible funding to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. In 2012, ODOT developed a statewide CMAQ program for Ohio's eight large MPOs (200,000+ population). The statewide program replaced the individual programs previously administered by the largest MPOs (the small MPOs still receive individual allocations). With one statewide budget, the eight large MPOs collectively establish, prioritize, and manage annual programs of CMAQ projects. In the NOACA region, these funds are commonly used for traffic signal upgrade projects, bus replacement, bike facilities, intelligent transportation system improvement, transit center, and park and ride lot construction. It is important to note that CMAQ funds cannot be used for general roadway or bridge maintenance projects. Based on historic NOACA project allocation, the long-range transportation plan assumes 50% of CMAQ will be purposed for transit, 25% for bicycle and pedestrian, and 25% for roadway operational improvements.
- **NOACA STBG - Federal.** FHWA directs STBG funding to NOACA through ODOT by a distribution formula for MPOs of regions with a population greater than 200,000, and ODOT suballocates an additional amount of discretionary STBG. STBG funds through NOACA are primarily prioritized for projects that support transportation asset management planning to preserve and improve the operation and performance of federal-aid highways. These funds are also eligible to address bridge, pedestrian, and bicycle infrastructure; and transit capital projects through flex fund transfers to the Federal Transit Administration (FTA). The NOACA Board of Directors also currently sets aside \$2 million of STBG annually to support a Transportation for Livable Communities Initiative (TLCI) to support transportation studies and implementation projects that are focused on livability.
- **NOACA STBG Set-Aside: Transportation Alternative Program (TAP) - Federal.** NOACA still refers to STBG Set-Aside funds as TAP funds. The TAP provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities; infrastructure projects for improving nondriver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and

other roadways largely in the right-of-way of former Interstate System routes or other divided highways.

There are several other federal, state and local sources of funding that are invested in the NOACA region through non-ODOT and non-NOACA administered programs. They include:

Federal Source:

- **ODNR Recreational Trails Program – Federal.** The **Recreational Trails Program** (RTP) provides federal funds to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. Federal transportation funds benefit recreation, including hiking, bicycling, in-line skating, equestrian use, cross-country skiing, snowmobiling, off-road motorcycling, all-terrain vehicle riding, four-wheel driving, or using other off-road motorized vehicles. RTP is funded through a set-aside of funds from the STBG program. The amount set aside is equal to the State's FY 2009 RTP apportionment.¹³² The RTP in Ohio is managed by the Ohio Department of Natural Resources.

State Sources:

- **Ohio Public Works Commission (OPWC) – State.** The OPWC provides financing for local public infrastructure improvements through both the State Capital Improvement Program (SCIP) and the Local Transportation Improvement Program (LTIP). OPWC funding is allocated to geographic districts across the state. NOACA region comprises all of District 1 and portions of Districts 7 and 9. Historically, NOACA region counties in Districts 7 and 9 have received an 87% share of the funding.
- SCIP is a grant/loan program for roads, bridges, water supply, wastewater treatment, storm water collection, and solid waste disposal. The SCIP was created in 1987 and renewed in 1995, 2005, and 2014 by amendments that created Sections 2k, 2m, 2p, and 2s of Article VIII of the Ohio Constitution. These Constitutional provisions allow the State to use its general revenues as debt support to issue general obligation bonds up to \$175 million in fiscal years 2017 to 2021 and \$200 million in fiscal years 2022 to 2026.
- LTIP is a grant program for roads and bridges only. The LTIP was created by the legislature in 1989 and provides the equivalent of one cent in gasoline tax receipts annually (currently approximately \$61 million statewide).¹³³
- **Ohio Department of Natural Resources (ODNR): Clean Ohio Trail Program – State.** The Clean Ohio Trails Fund funds trail-related projects, including land acquisition for a trail, trail development, trailhead facilities, and engineering.

Local Sources:

- **State Motor Fuel Tax (Local portion).** As noted previously, local governments receive 33% of the MFT generated. Funds are collected and distributed at the state level. All 88 counties and townships receive equal gas tax distribution. Meanwhile the municipal share is determined by motor vehicle license registrations. These annual distributions come in the form of two motor vehicle tax funds: the 7060 Fund, which provides

¹³² Federal Highway Administration, https://www.fhwa.dot.gov/environment/recreational_trails/

¹³³ Ohio Public Works Commission, <http://www.pwc.state.oh.us/OPWCOverview.html?m>.

allocations to localities from the gasoline excise tax distribution, and the 7068 Fund, which is dedicated to state and local government highway distributions.

- **State Motor Vehicle License Tax.** The Ohio Bureau of Motor Vehicles is responsible for the collection and distribution of taxes from the sale of license plates.¹³⁴ The license tax is collected at the point of sale. Funding from the motor vehicle license tax is directly allocated to political subdivisions. The distributions for the motor vehicle license tax are follows:
 - 34% is distributed at the district-level (this includes municipal and township registration)
 - 47% of all license revenue is collected and distributed to the county in which the resident resides
 - 9% is distributed to the counties by road mileage
 - 5% is distributed to the townships by road mileage
 - 5% is collected and distributed equally among the counties

Permissive license tax fees are also available in each county and taxing district. Permissive license tax is an optional tax that can be levied by counties and/or taxing districts on vehicle registrations. Permissive taxes are incorporated into the revenue assumptions of this plan.

Transit Funding

The five public transit systems within the NOACA region operate independently and have individual service areas. The region receives transit funding from several Federal Transit Administration (FTA) programs, flexible federal funds through ODOT, NOACA-administrated funding programs, and local funding sources.

- **Section 5307 Urbanized Area Formula - Federal.** Section 5307 program funds make up about 45% of available federal funds. In Ohio for urbanized areas with a population of 200,000 and more, funds are apportioned and flow directly to the transit agency designated recipient to apply for and receive federal funds. In the NOACA region this includes the Greater Cleveland Regional Transit Authority (GCRTA), Laketran, and Lorain County Transit (LCT). For urbanized areas under 200,000 in population, the funds are apportioned to the governor of each state for distribution. In the NOACA region this includes Medina County Public Transit (MCPT) and Geauga County Transit (GCT).

Transit agencies can spend Section 5307 resources on capital projects, planning, and preventative maintenance, but in most cases service operations are excluded. Some exceptions are available for urban areas with a population of less than 200,000; these agencies may use Section 5307 funds for operating assistance, and in limited cases,

134 Ohio Revised Code 4501.04.

urban areas with populations of 200,000 or more may use Section 5307 funds for operations if they operate 100 or fewer vehicles during peak periods.¹³⁵

- **Section 5311 Non-Urbanized (Rural) Area Formula - Federal.** Section 5311 program makes up about 9% of available federal funds. The program provides funding for rural transit capital, operating, and planning activities. Section 5311 funds are distributed to ODOT, which then allocate funds to rural transit operators. A small portion of the program is set aside for formula allocation to Indian tribes, intercity bus services, and the Appalachian Development program.
- **Section 5310 Enhanced Mobility for Older Adults and People with Disabilities - Federal.** Roughly 2% of available federal program funds are designated for use in urban (80%) and rural areas (20%). The funds are intended to support services for older adults and people with disabilities. At least 55% must be used for capital projects planned, designed, and carried out to meet the special needs of seniors and individuals with disabilities, including mobility management activities. Up to 45% of Section 5310 funds may be used for operating assistance. Funds may also be used for program administration and technical assistance. NOACA serves as direct recipient for the 5310 program urban area program funds. ODOT serves as direct recipient for the rural areas of the region.
- **Section 5337 State of Good Repair - Federal.** Section 5337 program funds make up roughly 20% of available federal funds. The 5337 program was new under MAP-21 and is intended to support existing fixed guideway (rail, streetcar, and BRT) services that have been operating for at least seven years. It replaces the former Section 5309 Fixed Guideway Modernization Program. GCRTA is the only transit agency in the NOACA region with existing fixed guideway that meets the program requirements.
- **Section 5339 Bus and Bus Facilities - Federal.** The Section 5339 program funds make up roughly 4 percent of available federal funds and replaces the former discretionary Section 5309 Bus and Bus Facilities program. Funding is available for capital purposes, including preventive maintenance; operating assistance is not an eligible expense.
- **Congestion Mitigation Air Quality (CMAQ) - Federal.** As previously stated, CMAQ provides flexible funding to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Based on historic NOACA project allocation, the plan assumes 50% of CMAQ will be purposed for transit, 25% for bicycle and pedestrian, and 25% for roadway operational improvements.
- **Ohio Transit Preservation Partnership Program (OTPPP) - Federal.** Supported by CMAQ and STBG through ODOT. ODOT instituted the Ohio Transit Preservation Partnership Program to provide federal funds to urban transit systems in Ohio beginning

135 Federal Transit Administration, Urbanized Area Formula Grants (5307) Program Guidance, <https://www.transit.dot.gov/funding/grants/urbanized-area-formula-grants-5307>.

in state fiscal year 2012. The OTPPP is a discretionary program, and projects are selected on a competitive basis with an emphasis on preservation. Preservation is defined as the process of working to maintain, sustain, or keep in a good sound state the transit systems in Ohio. Because the sources of funds for this program are federal ODOT Congestion Mitigation Air Quality (CMAQ) and Surface Transportation Block Grant (STBG) dollars, projects must be CMAQ and STBG eligible under Title 23 USC Sections 104(b)(2) and 104(b)(3).

- **Ohio Public Transportation Grant Program (OPTGP) - Federal.** Supported by CMAQ and STBG through ODOT. The Urban Transit Program encompasses funding administered by ODOT for transit service in Ohio's urbanized areas with populations of 50,000 or greater. The program goals are to facilitate the most efficient and effective use of both federal and state funds in the provision of transportation services. The small urban transit systems receive state funds to leverage federal dollars, and the large eight transit systems receive federal funds allocated by the Ohio Department of Transportation.

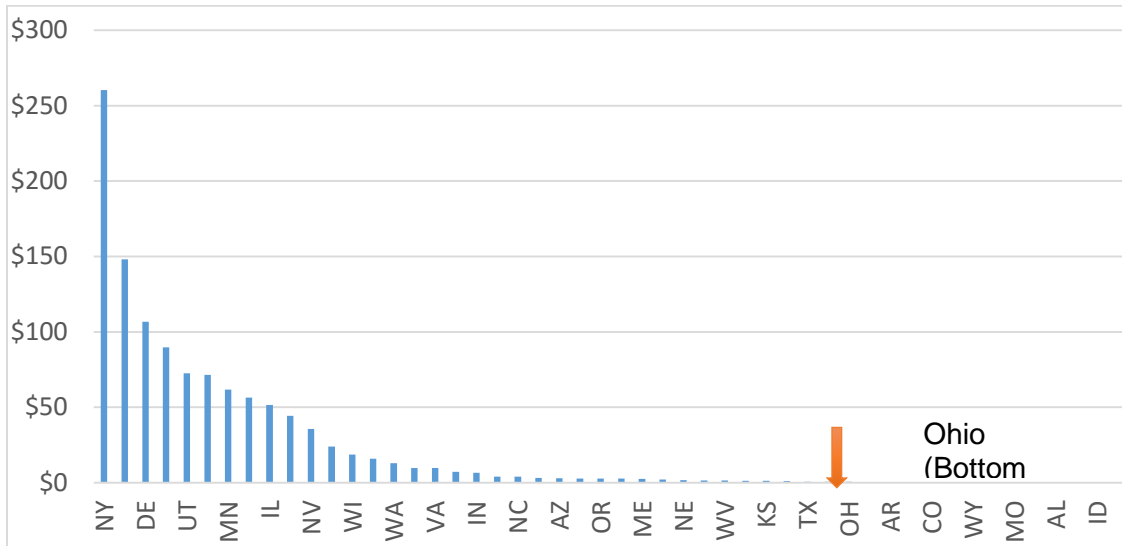
These programs are distributed or competitively sought based on a variety of formulas set by law and ODOT priority. They are broadly designed to allocate resources based—depending on the program—on factors that include population, population density, number of low-income individuals, elderly individuals, individuals with disabilities, and a number of transit service characteristics (e.g., revenue vehicle miles, route miles, etc.).¹³⁶

Local sources make up the majority of funding available for transit operations and capital projects. Local sources primarily consist of taxes (property, sales and use tax) and fare box revenues.

Data (Figure 5.1-4) shows that Ohio is among the states with the lowest state-funded support for public transit. Based on 2014 funding data submitted by transit agencies to the Federal Transit Administration, Ohio ranked in the bottom 14. Among the neighboring states (Figure 5.1-5), Pennsylvania provides the highest support for transit operating expenses (i.e., 47% share). The State of Ohio provided less than 1% of operating expenses in 2014.

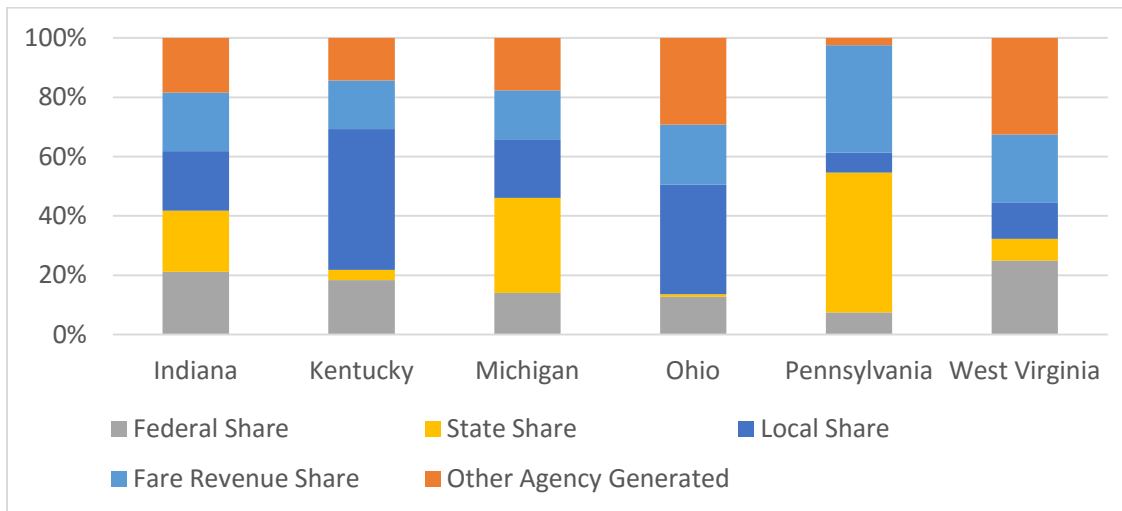
136 Programs Description Source: ODOT Transit Needs Study, 2014, <http://www.dot.state.oh.us/Divisions/Planning/Transit/TransitNeedsStudy/Pages/StudyHome.aspx>; FTA Grants website: <https://www.transit.dot.gov/grants>.

Figure 5.1-4: State Funding for Transit Operations (Funding Per Capita)



Source: National Transit Database, 2014

Figure 5.1-5: Operating Funding Shares



Source: National Transit Database, 2014

Forecasted Revenue and Project Cost Assumptions

Revenue and cost estimates that support the metropolitan transportation plan must use inflation rates to reflect “year of expenditure dollars,” based on reasonable financial principles and information, and developed cooperatively by NOACA, ODOT, and public transportation operators. This section defines the base assumptions used for the development of both the forecasted revenue and forecasted project costs.

Forecasted Revenue Assumptions

The financial resources projected to be available for the NOACA 20-year planning horizon of 2018-2040 come from various federal, state, and local funding sources. As previously noted, certain funds are controlled by ODOT and allocated through ODOT’s project selection process for the particular fund program type. Some of the funds are controlled by NOACA and allocated

through NOACA's project selection process. Three of the five transit agencies in the region have urban direct recipient designation to receive direct federal assistance and manage project selection and implementation. Local jurisdictions provide funding, which is used to match federal funds and state funds, and for direct operations and maintenance of the local system.

A cooperative approach between ODOT, MPOs, and the transit agencies has been followed in an effort to best define and guide a financial planning process. This approach includes the development of a standard methodology used statewide to project base funding level assumptions for the MPO transportation plans.

The methodology described below is the approach NOACA has opted to follow for establishing *AIM Forward 2040* revenue assumptions. This methodology ensures consistency between NOACA, ODOT and transit agency financial planning assumptions and outcomes. It also helps foster a relationship between the parties, which is essential to continuing the process of completing the necessary transportation investments in the region's multimodal transportation network. Recognizing that the federal, state, and local funding sources described in the previous section are largely collected and allocated for specific project eligibility, the revenue methodologies are focused into two categories: 1. Roadway and Bicycle/Livability, and 2. Transit.

Methodology:

1. **Roadway and Bicycle/Livability:** Capture historic (SFYs 2005-2016) transportation investments data (federal, state, & local) for the NOACA region from ODOT's Ellis project management data base.
 - a. Remove any projects classified as Emergency or American Recovery and Reinvestment Act (ARRA) stimulus funding. These types of projects will inflate revenue projections and are not indicative of future funding levels.

Transit: Capture available five-year (2012-2016) historic operating and capital budget data through analysis of each transit agency budget.

2. **Roadway and Bicycle/Livability:** Establish base-level funding for all federal, state, and local match to ODOT dollars. The base-level funding numbers are based on the average annual expenditure levels from the historical data. Expenditure levels refer to dollars that are encumbered and committed.
 - a. Create an average for each type of funding by adding up the yearly encumbrances by funding type and dividing by the number of fiscal years.

Transit: Establish base-level funding for all federal, state, and local transit dollars. The base-level funding numbers are based on the average annual budget levels from the five-year historical data for both operating and capital.

- a. Create an average for each type of funding by adding the yearly operating and capital budgets and dividing by the number of fiscal years of available data.
3. **Establish FY 2018-2040 Transportation Plan funding level projections:** NOACA has established three scenarios: Trend Growth, the most likely scenario; FAST Act Average Growth; and No Growth.

Trend Growth Scenario – Assumes continued annual federal growth rate equal to the FAST Act annual growth rate.

- a. **Federal Funding: Roadway and Bicycle/Livability:** Consistent with FAST Act increased levels through SFYs 2020–2018: 2.16%, 2019: 2.25%, 2020: 2.39; and an additional 0.08% applied each year thereafter through 2040. **Transit:** Consistent with FAST Act increased levels, 1% for SFYs 2018- 2020; and an additional 1% applied each year thereafter through 2040. Assumes continued FAST Act growth and transfer to the Mass Transit Account based on the average annual FAST Act increase rate.
- b. **State Funding:** Consistent with the 2018-2019 ODOT Business Plan projections, apply a growth rate of 1% for SFYs 2018-2019, and 1% for each year FY 2020-2040. The NOACA transportation demand model projects a 1% annual increase in vehicle miles traveled (VMT) for the region through 2040. Therefore the assumption is that state motor fuel tax funding will continue to increase as well through 2040.
- c. **Local: Roadway and Bicycle/Livability:** Local funding projections are developed based on estimates of motor fuel and historic (2012-2016) vehicle registration taxes distributed to local governments. Federal and state matching needs are accounted for first, and the remainder is expected to be available for operations and maintenance of the system. Based on historic expenditures, local match to ODOT is indexed at a rate of 3% of total federal and state funding. Local match to NOACA and other available programs is calculated based on the individual requirements of those programs.

Assuming continued growth for federal and state funding assumes continued growth for local funds. **Motor Fuel Tax:** Growth rate consistent with the 2018-2019 ODOT Business Plan projections, apply a growth rate of 1% for SFYs 2018-2019, and 1% for FY 2020-2040. **Vehicle Registration Tax (VRT):** Growth rate equals 0.06%, which is the average annual increase of actual disbursements to local governments for the five-year period of 2012-2016. This does not include permissive vehicle registration taxes.

Transit: Total local revenue is calculated by subtracting the amounts of federal and state projected assistance from overall capital and operating budgets. The less federal and state revenue projected, the more the burden shifts to local funding to maintain service.

FAST Act Average Growth Scenario – Assumes federal growth rate equal to the flat five-year average of FAST Act apportionments.

- a. **Federal Funding:** Consistent with FAST Act increased levels through SFY 2021–2018: 2.16%, 2019: 2.25%, 2020: 2.39; 2% thereafter for each SFY 2021 through 2040. This assumes 2% continued growth based on FAST Act average increase rates. Assumes continued FAST Act growth and transfer to the Mass Transit Account based on the average annual FAST Act increase rate.
- b. **State Funding:** Remains consistent with Trend Growth Scenario based on a modeled VMT increase of 1% annually through 2040.
- c. **Local Funding: Roadway and Bicycle/Livability:** Remains consistent with Trend Growth Scenario based on a modeled VMT increase of 1% annually through 2040. Assuming a modeled state funding increase assumes continued

growth for local funds as well based on MFT and VRT. **Transit:** Total local revenue is calculating by subtracting the amounts of federal and state projected assistance from overall capital and operating budgets. The less federal and state revenue projected, the more the burden shifts to local funding to maintain service.

No Growth Scenario – Assumes no federal revenue growth past current FAST Act funding apportionments.

- a. **Federal Funding:** Consistent with FAST Act increased levels through SFY 2021–2018: 2.16%, 2019: 2.25%, 2020: 2.39; 0% thereafter for each SFY 2021 through 2040. This assumes no growth post FAST Act implementation.
- b. **State Funding:** Remains consistent with Trend Growth Scenario based on a modeled VMT increase of 1% annually through 2040.
- c. **Local: Roadway and Bicycle/Livability:** Remains consistent with Trend Growth Scenario based on a modeled VMT increase of 1% annually through 2040. Assuming a modeled state funding increase assumes continued growth for local funds as well based on MFT and VRT. **Transit:** Total local revenue is calculating by subtracting the amounts of federal and state projected assistance from overall capital and operating budgets. The less federal and state revenue projected, the more the burden shifts to local funding to maintain service.

Figure 5.1-6 summarizes the estimated growth percentages for each scenario calculated in accordance with the above methodology.

Figures 5.1-7 through Figure 5.1-9 summarize the total revenue anticipated to be available for each scenario.

Figure 5.1-6: AIM Forward 2040 Forecasted Revenue Scenarios

Year	• Trend Growth						• FAST Act Average Growth						• No Federal Growth					
	Federal Highway	Federal Transit	State	Local MFT	Local VRT	Local Transit	Federal Highway	Federal Transit	State	Local MFT	Local VRT	Local Transit	Federal Highway	Federal Transit	State	Local MFT	Local VRT	Local Transit
2018	2.16%	1.00%	1.00%	1.00%	0.60%	1.00%	2.2 %	1.00%	1.00%	1.00%	0.60%	1.00%	2.16 %	1.00%	1.00 %	1.00 %	0.60%	1.00%
2019	2.25%	1.00%	1.00%	1.00%	0.60%	1.00%	2.3 %	1.00%	1.00%	1.00%	0.60%	1.00%	2.25 %	1.00%	1.00 %	1.00 %	0.60%	1.00%
2020	2.39%	1.00%	1.00%	1.00%	0.60%	1.00%	2.4 %	1.00%	1.00%	1.00%	0.60%	1.00%	2.39 %	1.00%	0.00 %	0.00 %	0.60%	1.00%
2021	2.47%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2022	2.55%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2023	2.63%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2024	2.71%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2025	2.79%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2026	2.87%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2027	2.95%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2028	3.03%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2029	3.11%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2030	3.19%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2031	3.27%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2032	3.35%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2033	3.43%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2034	3.51%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2035	3.59%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2036	3.67%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2037	3.75%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2038	3.83%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2039	3.91%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%
2040	3.99%	1.00%	1.00%	1.00%	0.60%	1.00%	2.0 %	1.00%	1.00%	1.00%	0.60%	1.00%	0.00 %	0.00 %	0.00 %	0.00 %	0.60%	1.00%

Figure 5.1-7: Total Revenue for Projects under Trend Growth Scenario

Year	Roadway	Bicycle/Livability	Transit	Total
2018	\$492,232,685	\$12,357,609	\$109,174,942	\$613,765,235
2019	\$498,786,204	\$12,611,111	\$110,404,139	\$621,801,455
2020	\$505,673,391	\$12,886,445	\$111,664,462	\$630,224,299
2021	\$516,870,638	\$13,177,796	\$112,950,333	\$642,998,768
2022	\$524,315,592	\$13,486,013	\$114,262,680	\$652,064,284
2023	\$532,038,634	\$13,812,005	\$115,602,490	\$661,453,130
2024	\$540,053,695	\$14,156,748	\$116,970,817	\$671,181,260
2025	\$548,375,684	\$14,521,287	\$118,368,781	\$681,265,752
2026	\$557,020,562	\$14,906,740	\$119,797,580	\$691,724,882
2027	\$566,005,422	\$15,314,308	\$121,258,488	\$702,578,219
2028	\$575,348,571	\$15,745,279	\$122,752,867	\$713,846,717
2029	\$585,069,623	\$16,201,031	\$124,282,170	\$725,552,825
2030	\$595,189,597	\$16,683,046	\$125,847,949	\$737,720,592
2031	\$605,731,025	\$17,192,910	\$127,451,861	\$750,375,796
2032	\$616,718,068	\$17,732,329	\$129,095,680	\$763,546,078
2033	\$628,176,648	\$18,303,131	\$130,781,303	\$777,261,082
2034	\$640,134,578	\$18,907,282	\$132,510,757	\$791,552,616
2035	\$652,621,718	\$19,546,892	\$134,286,215	\$806,454,825
2036	\$665,670,135	\$20,224,228	\$136,110,006	\$822,004,370
2037	\$679,314,284	\$20,941,729	\$137,984,624	\$838,240,637
2038	\$693,591,195	\$21,702,018	\$139,912,743	\$855,205,955
2039	\$708,540,687	\$22,507,914	\$141,897,235	\$872,945,835
2040	\$724,205,596	\$23,362,454	\$143,941,181	\$891,509,232
Total	\$13,651,684,233	\$386,280,306	\$2,877,309,303	\$16,915,273,841

Figure 5.1-8: Total Revenue for Projects under FAST Act Average Growth Scenario

Year	Roadway	Bicycle/Livability	Transit	Total
2018	\$492,232,685	\$12,357,609	\$109,174,942	\$613,765,235
2019	\$498,440,327	\$12,611,111	\$110,404,139	\$621,455,577
2020	\$504,978,177	\$12,886,445	\$111,664,462	\$629,529,084
2021	\$515,312,328	\$13,122,357	\$112,896,227	\$641,330,912
2022	\$521,414,076	\$13,362,987	\$114,142,611	\$648,919,674
2023	\$527,608,451	\$13,608,429	\$115,403,808	\$656,620,689
2024	\$533,897,041	\$13,858,781	\$116,680,013	\$664,435,834
2025	\$540,281,462	\$14,114,139	\$117,971,422	\$672,367,023
2026	\$546,763,361	\$14,374,605	\$119,278,238	\$680,416,204
2027	\$553,344,416	\$14,640,279	\$120,600,664	\$688,585,359
2028	\$560,026,333	\$14,911,268	\$121,938,908	\$696,876,509
2029	\$566,810,854	\$15,187,676	\$123,293,178	\$705,291,708
2030	\$573,699,750	\$15,469,612	\$124,663,689	\$713,833,051
2031	\$580,694,826	\$15,757,187	\$126,050,656	\$722,502,670
2032	\$587,797,920	\$16,050,514	\$127,454,300	\$731,302,733
2033	\$595,010,903	\$16,349,707	\$128,874,843	\$740,235,453
2034	\$602,335,684	\$16,654,884	\$130,312,511	\$749,303,079
2035	\$609,774,205	\$16,966,164	\$131,767,535	\$758,507,904
2036	\$617,328,443	\$17,283,670	\$133,240,146	\$767,852,260
2037	\$625,000,415	\$17,607,527	\$134,730,583	\$777,338,525
2038	\$632,792,173	\$17,937,860	\$136,239,084	\$786,969,118
2039	\$640,705,809	\$18,274,800	\$137,765,895	\$796,746,504
2040	\$648,743,452	\$18,618,479	\$139,311,262	\$806,673,192
Total	\$13,074,993,091	\$352,006,090	\$2,843,859,116	\$16,270,858,297

Figure 5.1-9: Total Revenue for Projects under No Growth Scenario

Year	Roadway	Bicycle/Livability	Transit	Total
2018	\$492,578,562	\$12,357,609	\$109,174,942	\$614,111,113
2019	\$499,135,541	\$12,611,111	\$110,404,139	\$622,150,791
2020	\$504,978,177	\$12,886,445	\$111,664,462	\$629,529,084
2021	\$512,009,374	\$12,886,445	\$111,664,462	\$636,560,281
2022	\$515,131,221	\$12,886,445	\$111,664,462	\$639,682,128
2023	\$518,282,206	\$12,886,445	\$111,664,462	\$642,833,113
2024	\$521,462,608	\$12,886,445	\$111,664,462	\$646,013,515
2025	\$524,672,708	\$12,886,445	\$111,664,462	\$649,223,615
2026	\$527,912,790	\$12,886,445	\$111,664,462	\$652,463,698
2027	\$531,183,143	\$12,886,445	\$111,664,462	\$655,734,050
2028	\$534,484,055	\$12,886,445	\$111,664,462	\$659,034,963
2029	\$537,815,820	\$12,886,445	\$111,664,462	\$662,366,727
2030	\$541,178,733	\$12,886,445	\$111,664,462	\$665,729,640
2031	\$544,573,092	\$12,886,445	\$111,664,462	\$669,124,000
2032	\$547,999,200	\$12,886,445	\$111,664,462	\$672,550,107
2033	\$551,457,359	\$12,886,445	\$111,664,462	\$676,008,266
2034	\$554,947,878	\$12,886,445	\$111,664,462	\$679,498,785
2035	\$558,471,067	\$12,886,445	\$111,664,462	\$683,021,974
2036	\$562,027,238	\$12,886,445	\$111,664,462	\$686,578,146
2037	\$565,616,709	\$12,886,445	\$111,664,462	\$690,167,617
2038	\$569,239,799	\$12,886,445	\$111,664,462	\$693,790,706
2039	\$572,896,830	\$12,886,445	\$111,664,462	\$697,447,737
2040	\$576,588,128	\$12,886,445	\$111,664,462	\$701,139,035
Total	\$12,364,642,238	\$295,584,065	\$2,564,532,790	\$15,224,759,092

Forecasted Projects and Cost Assumptions

Project Cost Estimate Assumptions

To estimate project inflation over the life of *AIM Forward 2040*, NOACA relied upon ODOT's annual *Construction Cost Outlook and Forecast* report.¹³⁷ The report is prepared annually by the ODOT Bid Analysis & Review Team in the Office of Estimating. Key factors and inputs analyzed by ODOT in the report include state and global economies and construction input trends associated with labor, contractor and supplier margins, oil and gas, and other commodities, such as asphalt, concrete and steel.

The expected ODOT Construction Cost Inflation Forecast is presented in Figure 5.1-10. The table presents estimated inflation for high, most likely, and low scenarios. NOACA is using the "most likely" scenario to estimate all project costs planned in *AIM Forward 2040*.

Under this scenario, inflation is estimated to be 2.7% in CY2017, which is a decrease of 1.3% from the 4.0% forecast in January 2016. Inflation is expected to increase to 3.7% in CY2018. CY2019 and CY2020 are expected to be similar with 3.8% and 3.7%, respectively, and then leveling out at 3.5% in CY2021. From CY2022 through CY2026 inflation is forecast to be 3.5% based upon average rates over 30 to 60 years as measured by the Gross Domestic Product (GDP) deflator and the Consumer Price Index (CPI). The long-term forecast from 2027 onward is 2.0%, according to ODOT, based on the Federal Reserve's long-run inflation target rate.¹³⁸

Projected annual and compound inflation for each year of *AIM Forward 2040* is contained in Figure 5.1-11. Over the life of the plan, costs are estimated to increase 60%. Therefore, what costs \$1.00 to purchase in the plan adoption year of 2017 is estimated to cost \$1.60 in the 2040 horizon year. For this reason, monitoring inflation and adjusting estimates of planned projects accordingly will be important if the region is going to successfully deliver the planned program of projects in the optimal year of implementation.

Figure 5.1-10: ODOT Construction Cost Inflation Forecast Scenarios

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022-2026	FY 2027-2040
High	7.0%	7.6%	6.8%	6.7%	6.5%	-	-
Most Likely	2.7%	3.7%	3.8%	3.7%	3.5%	3.5%	2.0%
Low	0.0%	0.5%	0.8%	0.7%	0.5%	-	-

137 ODOT January 2017 Construction Cost Outlook and Forecast, http://www.dot.state.oh.us/Divisions/ConstructionMgt/Estimating/TrendsAndForecasts/Jan2017_Construction_Cost_Forecast.pdf.

138 Board of the Governors of the Federal Reserve System, Summary of Economic Projections, updated December 2016, <https://www.federalreserve.gov/monetarypolicy/fomcproptabl20160615.htm>.

Figure 5.1-11: Annual and Compound Inflation Factors

SFY	Annual	Compound
2018	3.7%	3.7%
2019	3.8%	7.6%
2020	3.7%	11.6%
2021	3.5%	15.5%
2022	3.5%	19.6%
2023	3.5%	23.8%
2024	3.5%	28.1%
2025	3.7%	32.6%
2026	3.5%	37.2%
2027	2.0%	40.0%
2028	2.0%	42.8%
2029	2.0%	45.6%
2030	2.0%	48.5%
2031	2.0%	51.5%
2032	2.0%	54.5%
2033	2.0%	57.6%
2034	2.0%	60.8%
2035	2.0%	64.0%
2036	2.0%	67.3%
2037	2.0%	70.6%
2038	2.0%	74.0%
2039	2.0%	77.5%
2040	2.0%	81.1%

Forecasted Projects

NOACA plans and data management tools, combined with solicitation of local and regional entities, were used to identify the projects contained in this plan to achieve the goals outlined in *AIM Forward 2040*.

The process also identified projects proposed for the region that need further analysis to determine conformance with NOACA transportation and fiscal planning requirements before amendment to the fiscally constrained plan. Those projects are referred to as “illustrative” projects.

Projects are grouped in the following categories:

Highway:

- Roadway Preservation – Projects that preserve pavement and bridge conditions
- Roadway Enhancement – Project that improve operations and safety
- Roadway Expansion – Projects that add significant capacity

Bicycle and Livability:

- Bicycle and Livability – Projects that support bicycle and alternate modes of **transportation for increased livability**

Transit:

- Transit Preservation – Projects that preserve vehicle and non-vehicle capital assets in a state of good repair
- Transit Operations – Operating costs for each transit agency to maintain existing level of service.

A description of each project category is provided below, followed by Figure 5.1-12, which contains the summary of costs by project type for each year of the plan. All costs have been updated in accordance with the projected inflation presented earlier in this chapter to show year of expenditure dollars.

Roadway Preservation Plan Projects

System preservation needs were estimated over the plan timeframe for the entire federal-aid network. Pavement and bridge projects were prioritized in accordance with the transportation asset management plan priority scenarios as discussed in chapter 3.2. The projects contained in the plan achieve a state of good repair for pavements (reaching the target of 80 regional Pavement Condition Rating (PCR) and bridges (addressing all bridges that reach deficient General Appraisal (GA) and other associated conditions factors). The plan assumes that deficient bridges present a higher safety concern than deficient pavement projects in the urban area, and therefore will be accounted for first each year before pavements.

Estimated costs for achieving a state of good repair for pavements is \$6.8 billion over the life of the plan. The estimated cost for achieving a state of good repair for bridges is \$3.3 billion over the life of the plan. Maintaining the region’s pavements and bridges is the greatest transportation system cost, representing a total of \$10.1 billion, or 64% of the projected needs.

Bicycle and Transportation for Livable Communities Initiative (TLCI) Plan Projects

Bicycle Plan Projects

Planned bikeways in the NOACA region include the Regional Priority Bikeway Network (RPBN) and an inventory of bikeway recommendations from local transportation plans, including NOACA’s TLCI.

The Regional Priority Bikeway Network is a vision of a system of interconnected routes throughout Northeast Ohio that are safe and convenient for bicyclists. To allow for safe and efficient bicycle transportation throughout the region, NOACA supports the provision of safe accommodations for bicyclists on roads within the region, with the RPBN taking priority for the development of bicycle facilities that serve riders of all ages with different skill levels. The RPBN was identified by using NOACA’s Potential Bikeway Demand layer, as well as other factors,

such as existing and planned bikeways, public transportation stops, current bicycle suitability of the road, and regional attractions.

To feed local bicycle traffic into the RPBN system, an inventory of bikeways was created for the 1997 bicycle plan, and edited and updated for the 2008 and 2013 bicycle plan updates. The inventory includes existing bikeways (on-road and off-road), and planned bikeways that were recommended in transportation planning studies within the region.

Bicycle/Pedestrian/Non-motorized (i.e., Amish buggy) plan projects will be prioritized for funding based on the following factors:

- Completion of a link on local, regional, or statewide facility
- New access to major destinations, such as employment centers, schools, places of business, modal connector facilities
- Safe accommodation on or adjacent to high-risk corridors
- Enhancement to existing facility (amenities, lighting, trailhead, etc.)

Estimated costs for the completion of all planned bikeways for the region are contained in Figure 5.1-12. The costs are categorized by county and total \$693.7 million. For the purpose of the plan, project costs will be averaged annually over the life of the plan as it is difficult to plan for a time frame for local sponsor priority, fiscal obligation, and implementation. Therefore, average annual project costs are \$30.2 million.

Figure 5.1-12: Estimated Cost of Planned Bicycle and Pedestrian Projects

County	Cost*
Cuyahoga	\$ 428.8
Geauga	\$ 38.1
Lake	\$ 50.7
Lorain	\$ 95.4
Medina	\$ 80.8
Total Cost	\$ 693.7
Average Annual Cost	\$ 30.2
* Assumes \$1million/mile for paths & Regional Priority Bikeway Network, \$100k/mile for bike lanes, \$50k/mile for bike routes.	

TLCI Plan Projects

The TLCI was created in 2005 and began funding planning studies in 2006. For the past decade the program has filled a need for local transportation planning that addresses regional conditions and goals. Between the first program year, 2006, and the present day, more than \$8 million has been programmed by NOACA for both planning studies and small construction projects to implement TLCI recommendations. In 2016, the NOACA Board of Directors committed \$2 million annually for TLCI liability studies and implementation projects. If NOACA were to program and expend the full \$2 million that is allocated annually for TLCI, the expected investment through 2040 will total \$46 million. On a regional scale, inclusive of local match, the

forecast for continued investment in the TLCI (assuming trends and continued funding) is \$55,200,000.

In 2015, NOACA analyzed the recommended project types from completed TLCI studies that evolved into funded construction projects (either through the TLCI implementation grant or the Surface Transportation Program) and categorized the projects by mode. The analysis showed a trend of prevalent recommendation types over the life of the program. The most common recommendations are by mode are given below.

Vehicular Recommendations:

- **Road Diet:** 14% of studies. With increasing focus on active transportation and safety, this percentage is likely to rise. Road diets do not add additional costs to standard repaving projects outside the cost of the striping plan.
- **On-street Parking:** 11% of studies. Particularly in urban core communities that have older corridors with closer street frontage, on-street parking will continue to be valuable for small business and entertainment districts. Typically including a parking lane is a reallocation of existing roadway space, so like a road diet, implementing this recommendation in projects over the life of the long-range plan will not add significant costs to repaving projects.
- **Parking:** 10% of studies. Off-street parking can be a contentious issue in neighborhoods as it often takes up valuable development space. Off-street parking is not an eligible project for NOACA funding programs, so there is no projected cost in the long-range plan.

Bicycle Recommendations:

- **Multiuse Path:** 21% of studies. Multiuse paths are a popular recommendation in TLCI studies as they can accommodate most cyclist types, as well as pedestrians. They are popular as connections within and to park systems, and in neighborhoods that are attractive to families. Because of potential right-of-way costs and geotechnical challenges, paths tend to be on the higher end of recommendation costs. A planning-level cost estimate for a multiuse path is \$138 per linear foot.
- **Bike Lanes:** 18% of studies. The cost of bike lanes can vary significantly, depending on the project type (standalone or as part of a larger rehabilitation), as well as the type of bike lane (regular, buffered, separated, protected). Regular bike lanes are recommended in most completed TLCI studies, though buffered and protected lanes are now gaining ground as recommendations. According to the Pedestrian and Bicycle Information Center, the average cost of a mile of regular bike lane (5 foot striping) is \$133,170 per mile, but this includes the construction of additional roadway.
- **Bike Parking:** 14% of studies. Bike parking is a popular recommendation in TLCI studies and is being incorporated into many of the projects funded by the TLCI implementation grant. The most common recommended type of bike parking is a hoop rack, which is affixed to a sidewalk or concrete pad. Hoop racks average \$100 per rack; it is ordinary to see these in pairs or sets of 2.

Pedestrian Recommendations:

- **Crosswalk Enhancements:** 17% of studies. Crosswalk improvements can range in detail and cost, but a simple high-visibility crosswalk striping averages \$2,540. A

popular recommendation in TLCI studies is a pedestrian refuge island, which can average over \$10,000 per island. With signalization, that cost can increase to \$30,000 per crossing.

- **Street Trees:** 12% of studies. Street trees can be useful to help narrow the visual perspective of the roadway, which has a traffic calming effect on drivers. Additionally, they often provide a barrier between pedestrians and traffic, and can help remove CO₂ from the air. The average cost of a street tree is \$430.
- **Benches:** 9% of studies. Benches can help improve walkability by giving pedestrians a place to rest or relax, and can make transit waiting environments more comfortable. Benches and other street furniture can also serve as a buffer between the sidewalk and traffic. The average cost of a pedestrian bench \$1,550.

Transit Recommendations:

- **Transit Waiting Environments (TWE):** 65% of studies. TWE are by and far the most popular transit recommendation in TLCI studies, as they are neighborhood scale and cheap relative to the costs of other transit infrastructure. TWE can be simple or detailed, which results in a corresponding low or high cost. TWE can include recommendations included in other categories, such as bike parking, benches, lighting, etc. The cost can vary depending on each TWE's elements, but range from \$20,000 to \$200,000.
- **New Bus Route:** 10% of studies. Bus routes are often recommended in TLCIs, usually as a feeder route to a higher capacity service. Usually the routes being recommended would be run by smaller transit vehicles, rather than a typical 40-foot bus. The cost can vary, depending on capacity, length of route, headways, and frequency.
- **New Station:** 8% of studies. Several TLCI studies have recommended new transit stations, usually along GCRTA's rail lines. The cost of a new station is one of the highest of typical TLCI recommendations. Costs range from \$16 million to \$60 million.

Estimated costs for the implementation of the TLCI program through 2040 total \$55.2 million. For the purpose of the plan, project costs will be averaged annually over the life of the plan as it is expected that NOACA will allocate the full \$2 million per year with an average of \$400,000 local contribution. Therefore, average annual project costs are \$2.4 million.

Roadway Enhancement

Projects that enhance the existing transportation system by improving operations for all users of the roadway were identified in coordination with local governments through a 2014 and 2017 project solicitation process. Enhancement projects include, but are not limited to:

- Minor widening to roadway standards
- Turn lane additions
- Intersection improvements
- Traffic signal upgrades
- Intelligent Transportation Systems (ITS)
- Roadway realignment
- Multimodal safety improvements

Estimated costs for the completion of all planned roadway enhancements for the region total \$143.0 million. More than 50% of the project needs are projected for 2018-2026, indicative that enhancement projects typically address a known and studied safety or congestion problem. All proposed roadway enhancement projects will be evaluated as they progress toward implementation to ensure they align with NOACA congestion management and local highway safety plans.

Transit Preservation

Transit preservation projects were identified in coordination with NOACA regional transit agencies. All five NOACA counties have transit agencies that operate and maintain their individual systems. For the purpose of this plan, transit preservation projects are classified into two primary categories, vehicle replacements and non-vehicle capital maintenance. Vehicle replacements include all costs necessary to keep rolling stock fleets, including standard bus, BRT, light transit vehicles, and rail cars, in a state of good repair in accordance with FTA useful life guidelines. Non-vehicle capital maintenance projects include all costs necessary to maintain safe stations, shelters, rail lines and appurtenances, fueling stations, and other capital assets.

In 2017 NOACA will work with transit agency partners to initiate a comprehensive transit asset management plan. The plan will further analyze transit capital maintenance needs and potential funding sources.

Transit Operations

Transit operating costs were identified in coordination with NOACA regional transit agencies and in a review of available operating budgets. All five NOACA counties have transit agencies that operate individual systems. Operations costs include salaries for agency staff, fuel, and service contracts. For the purpose of this plan, transit operating costs are equal to the revenue that is projected to be available.

Figure 5.1-13: Summary of Costs by Project Type (Year of Expenditure)

SFY	Roadway					Bicycle/TLCI	Transit	TOTAL COST
	Bridge	Pavement	Enhancement	Expansion	Total Roadway	Bicycle and Livability	Transit Preservation	
2018	\$47,053,305	\$595,255,032	\$31,536,380	\$318,446,096	\$992,290,812	\$33,767,330	\$76,104,393	\$1,102,162,536
2019	\$85,162,702	\$498,325,208	\$7,760,887	\$31,500,000	\$622,748,798	\$35,050,489	\$79,181,502	\$736,980,788
2020	\$56,184,015	\$542,513,909	\$16,042,613	\$8,600,000	\$623,340,537	\$36,347,357	\$82,044,243	\$741,732,137
2021	\$63,717,748	\$627,488,069	\$27,821,434	\$ -	\$719,027,252	\$37,619,514	\$84,915,792	\$841,562,558
2022	\$29,414,645	\$587,790,019	\$11,225,815	\$ -	\$628,430,479	\$38,936,197	\$146,034,130	\$813,400,806
2023	\$82,731,116	\$458,622,220	\$4,826,591	\$398,950,000	\$945,129,927	\$40,298,964	\$214,796,925	\$1,200,225,816
2024	\$32,077,233	\$389,166,785	\$14,563,868	\$ -	\$435,807,886	\$41,709,428	\$222,314,817	\$699,832,131
2025	\$66,857,873	\$247,359,971	\$18,791,228	\$ -	\$333,009,073	\$43,169,258	\$163,729,558	\$539,907,889
2026	\$58,561,517	\$290,802,947	\$5,762,969	\$ -	\$355,127,433	\$44,680,182	\$169,460,093	\$569,267,707
2027	\$38,320,588	\$218,544,063	\$ -	\$17,200,000	\$274,064,651	\$45,573,786	\$102,954,364	\$422,592,801
2028	\$253,230,486	\$121,465,574	\$ -	\$ -	\$374,696,060	\$46,485,261	\$106,155,507	\$527,336,828
2029	\$338,639,516	\$255,299,829	\$4,368,363	\$ -	\$598,307,708	\$47,414,966	\$107,113,721	\$752,836,395
2030	\$265,950,637	\$145,619,966	\$9,965,984	\$236,116,000	\$657,652,586	\$48,363,266	\$109,166,880	\$815,182,733
2031	\$353,108,098	\$138,977,976	\$3,029,897	\$225,000,000	\$720,115,971	\$49,330,531	\$111,350,218	\$880,796,720
2032	\$327,712,959	\$100,586,804	\$ -	\$ -	\$428,299,763	\$50,317,142	\$113,669,937	\$592,286,841
2033	\$142,484,652	\$116,499,288	\$315,230	\$ -	\$259,299,171	\$51,323,485	\$115,943,336	\$426,565,991
2034	\$151,138,134	\$118,299,632	\$ -	\$ -	\$269,437,766	\$52,349,954	\$118,262,203	\$440,049,923
2035	\$208,325,180	\$196,109,915	\$ -	\$ -	\$404,435,095	\$53,396,953	\$120,529,057	\$578,361,105
2036	\$217,263,031	\$198,034,331	\$ -	\$290,117,000	\$705,414,362	\$54,464,892	\$122,939,638	\$882,818,893
2037	\$191,273,852	\$192,269,836	\$ -	\$ -	\$383,543,688	\$55,554,190	\$125,500,796	\$564,598,673
2038	\$111,258,329	\$325,258,249	\$ -	\$ -	\$436,516,578	\$56,665,274	\$128,010,811	\$621,192,664
2039	\$117,794,038	\$279,776,966	\$ -	\$ -	\$397,571,004	\$57,798,580	\$130,571,028	\$585,940,611
2040	\$83,560,349	\$154,465,467	\$21,726,042	\$ -	\$259,751,858	\$58,954,551	\$133,073,818	\$451,780,228
TOTAL	\$3,321,820,003	\$6,798,532,056	\$177,737,302	\$1,525,929,096	\$11,824,018,457	\$1,079,571,550	\$2,883,822,767	\$ 15,787,412,774

Innovative Financing Strategies

As the cost of transportation projects continues to outpace available financial resources, US DOT and state departments of transportation have identified and approved strategies to expand the capacity of the federal-aid and state-funded programs to implement projects.

Innovative financing tools assist ODOT and external funding program managers, such as NOACA, to advance projects while reducing costs, enhancing efficiency, and generating revenue. The innovative financing strategies identified below will continue to be pursued by ODOT and NOACA, where eligible, to advance the priority projects identified in this plan. These strategies do not provide additional revenue; rather they are financing mechanisms that spread or delay the cost of a project, typically with interest, over a defined number of years. These strategies allow ODOT and NOACA to implement projects sooner than they could otherwise be funded with traditional funding allocations. These strategies are typically reserved for high-cost projects that could not be implemented with traditional program funding allocations.

MPO Funding Exchange

ODOT allows MPOs to exchange funding in an effort to accelerate project delivery while ensuring maximum use of all available funds. To accomplish this, MPOs that are not able to use all of their allocated funding in a given state fiscal year may trade it all or a portion of it with another MPO to advance projects from the next fiscal year. The process is referred to as an exchange of budget. There are no costs or penalties incurred by either MPO in execution of the budget exchange. Also, there are no funding or scheduling impacts to any other projects approved in the NOACA Transportation Improvement Program. ODOT encourages the use of this process to ensure the timely expenditure of MPO-allocated funds and to realize a quicker public benefit. NOACA has used this strategy during the 2016-2019 TIP to advance ready projects.

Recommendation: Since SFY 2015, NOACA has aggressively pursued budget exchanges with other MPOs to advance projects identified in the TIP. Overall NOACA has borrowed a total of \$28 million to advance projects for implementation by one fiscal year and repaid those funds in the following fiscal year. Assuming an average inflation of 3%, that equates to a savings of \$840,000 in interest and delivery of the public benefit associated with the transportation improvement a year sooner.

NOACA will continue to pursue MPO budget exchanges as a means to advance projects in the TIP to save inflation costs and realize project benefits sooner.

Transportation Infrastructure Financing and Innovation Act (TIFIA)

The Transportation Infrastructure Financing and Innovation Act (TIFIA) provides federal credit assistance to eligible surface transportation projects. Innovative financing tools assist ODOT in reducing costs, enhancing efficiency, and generating revenue. TIFIA could be leveraged to close the funding gap for high-cost projects that have secured significant levels of funding and/or financing. To date, there have been no projects in the NOACA region that have explored TIFIA project financing.

Recommendation: NOACA will continue to inform sponsors of high-cost projects about the TIFIA requirements and benefits. Upon request, NOACA will also assist project sponsors in submitting applications for TIFIA project financing.

Advance Construction

ODOT uses advance construction to help manage fund appropriations and obligation limitations provided by the FHWA. Advance construction allows ODOT to gain federal authorization to begin federally eligible activities without obligating funding. At the time of authorization, FHWA

confirms that ODOT has followed all requirements necessary to execute a federal agreement. By placing the funds into advance construction, FHWA is not guaranteeing funding for the project but is indicating that the activities would be eligible. ODOT places most of its projects in advance construction at the time of authorization.

The advance construction is placed into two groups. The first group is identified as short term. This group is used for projects in which the funding will be converted as project expenditures take place and are exhausted by the completion of the federally eligible activities. By using advance construction, ODOT can convert its appropriations and obligation limitation for costs that are currently being incurred and maintain a balance throughout the federal fiscal year.

The second group is identified as long term. This group is used primarily for GARVEE bonds and MPO or CEAO SIB (State Infrastructure Bank) loans that are used and managed by ODOT (see below for details).

Recommendation: NOACA will explore with ODOT the ability to use advance construction as a strategy to authorize projects with local funds to be converted to NOACA federal funds when available.

Grant Anticipated Revenue Vehicles (GARVEE)

GARVEEs enable states to pay debt service and other bond-related expenses with future federal-aid highway funds. The law authorizing GARVEEs, however, makes it clear that a debt-financing instrument's eligibility for reimbursement with future federal-aid highway funding does not constitute a commitment, guarantee, or other obligation by the United States, nor does it create any right of a third party (such as an investor) against the federal government for payment.

The GARVEE bonds are retired using future federal funding to be received through the active and future highway authorization laws. Prior to a bond sale, the entire amount of the bond is put into advance construction by ODOT for the projects being funded with its proceeds. These amounts are then converted over an eight- to 12-year period to retire the bonds. These payments are made on either a level principal or level interest payment schedule, depending on the bond structure.

ODOT does not allow NOACA-administered federal funds to be an eligible source of repayment for its GARVEE or State Infrastructure Bank (SIB) Bond Programs. Therefore, NOACA and ODOT are currently evaluating the possibility of securing GARVEE bonds through the Cleveland-Cuyahoga County Port Authority. If approved, GARVEE secured through the Port would allow NOACA to advance needed, high-cost projects that otherwise would be delayed until funding is available. The result is a savings in cost due to inflation and quicker implementation and realization of the transportation benefit.

Recommendation: NOACA will explore with ODOT the ability to use advance construction as a strategy to authorize projects with local funds to be converted to NOACA federal funds when available.

State Infrastructure Bank (SIB)

ODOT maintains a direct SIB loan and bond financing program, authorized under the Ohio Revised Code, Chapter 5531, for the purpose of developing transportation facilities throughout Ohio. The SIB is used as a method of funding highway, rail, transit, intermodal, and other transportation facilities and projects that produce revenue to amortize debt. Per the SIB policy, the SIB prioritizes projects that contribute to the connectivity of Ohio's transportation system and further goals such as corridor completion, economic development, competitiveness in a global economy, and quality of life.

The Ohio SIB was capitalized with a \$40 million authorization of state general revenue funds (GRF) from the Ohio State Legislature, \$10 million in state motor fuel tax funds, and \$87 million in federal Title XXIII Highway Funds. Any highway or transit project eligible under Title XXIII, as well as aviation, rail and other intermodal transportation facilities, is eligible for direct loan funding under the SIB.

ODOT's objective is to maximize the use of federal and state funds to make direct loans to eligible projects. SIB loans are loans taken out by a NOACA or a local sponsor and paid off with federal MPO or CEAO funding. These loans have a typical repayment term of 10 years and are paid down using a level principal amortization schedule. Repayments are then re-loaned to subsequent projects, hence creating a SIB revolving loan program.

In recent years NOACA has aggressively pursued funding through the SIB loan program to advance several high-cost projects identified in the TIP. NOACA has also used SIB funding to implement priority initiatives of its Board of Directors such as the Provisional Transportation Asset Management Policy (PTAMP), which advanced more than \$36 million to roadway preservation backlog projects in SFY 2015-2016. To date NOACA has secured more than \$35 million in financing through the SIB to advance transportation projects.

Recommendation: NOACA will continue to pursue SIB loan program financing as a means to advance needed high-cost projects for the region. This effectiveness of this strategy is based on availability of SIB loan program funding at the time of project application.

Public-Private-Partnerships (P3s)

With the passage of Ohio House Bill 114, ODOT has joined many other states in embracing Public-Private-Partnerships (P3s) for delivery of public projects and services. P3s can provide numerous benefits in the finance, design, construction, maintenance, and operation of transportation facilities. ODOT has used P3 mechanisms to advance several high-cost projects statewide, including Interstate 90 Innerbelt bridges advanced in the NOACA 2014-2017 TIP.

Toll Credits

Toll Credits (TC) are credits that states earn from nonfederal capital expenditures that public or private agencies, such as the Ohio Turnpike, make “to build, improve, or maintain highways, bridges, or tunnels that serve the public purpose of interstate commerce.”¹³⁹

Section 120(j) of Title 23 permits the use of Toll Credits to fulfill some or all of the federal matching fund requirements normally associated with the financing of eligible Title 23 and Title 49 surface transportation capital, operating, or planning projects. The application of TC increases the federal share of a project, thereby reducing required nonfederal match requirements.

It is important to note that TCs are not “cash” or additional funding, but instead are credits that can be applied to surface transportation federal aid projects. Using TCs increases the percentage and amount of federal funding that is used to finance an eligible project.

NOACA has authorized the use of TC for the following activities, subject to the continued allocation of TC to NOACA by ODOT. Currently, TC is authorized through SFY 2021.

139 23 U.S. Code § 120 - Federal share payable

- **Urban Core Communities** – Projects sponsored by, and located within, communities identified in the current NOACA Urban Core Communities Policy are eligible for 90% NOACA funding participation, using 10% TC.
- **Disadvantaged Urban Core Communities** – Projects sponsored by, and located within, communities identified in the current NOACA Disadvantaged Urban Core Communities Policy are eligible for 95% NOACA funding participation, using 15% TC to increase funding over the standard 80% rate.
- **Environmental Justice Areas** – Projects sponsored by, and located within, environmental justice areas as defined by low-income and minority TAZs are eligible for 100% NOACA funding participation, using 20% TC to increase funding over the standard 80% rate.

Transportation for Livable Communities Initiative (TLCI) – Studies and implementation projects identified for funding through the NOACA TLCI Program are eligible for 100% NOACA funding participation, using 20% TC to increase funding over the standard 80% rate.

Options for Increased Revenue

Federal Discretionary Programs

Transportation Investment Generating Economic Recovery (TIGER)

This discretionary grant program provides a unique opportunity for US DOT to invest in road, rail, transit, and port projects that promise to achieve national objectives. Since 2009, Congress has dedicated nearly \$4.6 billion for seven rounds of TIGER grants to fund projects that have a significant impact on the nation, a region, or a metropolitan area. The eligibility requirements of TIGER allow project sponsors at the state and local levels to obtain funding for multimodal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. TIGER can fund port and freight rail projects, for example, which play a critical role in our ability to move freight, but have limited sources of federal funds. TIGER can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, MPOs, or others in contrast to traditional federal programs that provide funding to very specific groups of applicants (mostly state DOTs and transit agencies). This flexibility allows TIGER and our traditional partners at the state and local levels to work directly with a host of entities that own, operate, and maintain much of our transportation infrastructure, but otherwise cannot turn to the federal government for support.

Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE)

The FASTLANE program provides dedicated, discretionary funding for projects that address critical freight issues facing our nation's highways and bridges. The FASTLANE program was established in the Fixing America's Surface Transportation (FAST) Act to fund critical freight and highway projects across the country. The FAST Act authorized the program at \$4.5 billion for fiscal years 2016 through 2020, including \$850 million for FY 2017 to be awarded by the Secretary of Transportation.

Fixed Guideway Capital Investment Grant (CIP)

The discretionary Capital Investment Grant (CIG) program provides funding for fixed guideway investments such as new and expanded rapid rail, commuter rail, light rail, streetcars, bus rapid

transit, and ferries, as well as corridor-based bus rapid transit investments that emulate the features of rail. There are four categories of eligible projects under the CIG program: New Starts, Small Starts, Core Capacity, and Programs of Interrelated Projects.

- **New Starts** projects are new fixed guideway projects or extensions to existing fixed guideway systems with a total estimated capital cost of \$300 million or more, or that are seeking \$100 million or more in Section 5309 CIG program funds.
- **Small Starts** projects are new fixed guideway projects, extensions to existing fixed guideway systems, or corridor-based bus rapid transit projects with a total estimated capital cost of less than \$300 million and that are seeking less than \$100 million in Section 5309 CIG program funds.
- **Core Capacity** projects are substantial corridor-based capital investments in existing fixed guideway systems that increase capacity by not less than 10 percent in corridors that are at capacity today or will be in five years. Core capacity projects may not include elements designed to maintain a state of good repair.
- **Programs of Interrelated Projects** are made up of any combination of two or more New Starts, Small Starts, or Core Capacity projects. The projects in the program must have logical connectivity to one another and all must begin construction within a reasonable time frame.

Each type of project has a unique set of requirements in FAST, although many similarities exist among them. All projects must be evaluated and rated by FTA in accordance with statutorily defined criteria at various points in the development process. To be eligible to receive a construction grant, all projects must go through a multistep, multiyear process and receive at least a “Medium” overall rating, in addition to other requirements.

Taxes and Fees

Several tax and fee types could be explored by ODOT and/or local and regional agency project sponsors during the life of the plan to increase revenue for transportation system operations and maintenance. NOACA does not advocate for nor rely upon additional taxes or fees to support projects identified in this plan. These include, but are not limited to:

- Property Tax – on all real and public utilities property
- Fuel tax – on gasoline and diesel
- Vehicle Registration Tax – for a “regional transportation improvement project” as permitted by law, as the eight already defined “permissive” taxes that counties may assess may not be used for rail transit
- Environmental Tax – the “Environmental Tax” currently does not exist, but would be a new type of tax similar to the “sales tax” as it would be assessed once, at the point of purchase (unlike the property, fuel, and vehicle registration taxes)
- Tolls – tolling involves the imposition of a per-use fee on motorists for a given highway facility. Historically, these fees have generally been flat tolls that may vary by number of axles and distance driven, but not by time of day
- Congestion Pricing – congestion pricing can act as a tool for demand management. The variability of pricing depending on traffic conditions and policies capitalizes on market forces to manage the utility of finite roadway capacity

- Vehicle Miles Traveled (VMT) User Fee – VMT fees are distance-based fees levied on a vehicle user for use of a roadway system. As opposed to tolls, which are facility specific and not necessarily levied strictly on a per-mile basis, these fees are based on the distance driven on a defined network of roadways.

(Source: FHWA Innovative Finance Support, FHWA website, <https://www.fhwa.dot.gov/ipd/finance/>)

The revenue impact of the above taxes and fees vary significantly given the type, geographic application, and potential range of the tax or fee assessed.

Other sources may be pursued as well to include private sources such as civic foundations or developers that stand to benefit from a regional investment in transportation infrastructure. A strategic approach should be used to raise funds, which when best leveraged, will produce the highest possible “match” from federal sources.

Conclusion

The financial analysis indicates that all *AIM Forward 2040* projects can be accomplished under the Trend Growth and FAST Act Average scenarios because a positive total fund balance exists in 2040 (see Figure 5.1-14).

Figure 5.1-14: Projected Costs of Plan Projects Against Revenue Scenarios

	Roadway	Bicycle / Livability	Transit	Total
Trend	\$13,651,684,233	\$386,280,306	\$2,877,309,303	\$16,915,273,841
FAST Act Avg.	\$13,074,993,091	\$352,006,090	\$2,843,859,116	\$16,270,858,297
No Growth	\$12,364,642,238	\$295,584,065	\$2,564,532,790	\$15,224,759,092
<hr/>				
Projects	\$11,824,018,457	\$1,079,571,550	\$2,883,822,767	\$15,787,412,774

Because the no growth scenario is unrealistic over the long-term and there are sufficient revenues to meet costs in accordance with the likely Trend Growth and the FAST Act Average revenue scenarios, NOACA concludes that *AIM Forward 2040* is fiscally constrained.

5.2: Environmental Justice

Introduction

Environmental justice (EJ) is a framework to ensure that the benefits of regional transportation investments are shared by minority and low-income populations, and that these groups do not bear undo burdens of such investments.

The federal action requiring environmental justice was Presidential Executive Order 12898 issued on February 11, 1994, and states:

To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.

Identified Areas

At NOACA, Environmental Justice areas are identified at the Transportation Analysis Zone (TAZ) level. A TAZ is a grouping of Census blocks, but generally not an entire Census tract, which allows for a refined approach with significant accuracy, small enough to capture population within a tiny geography, yet large enough to leverage accurate sample data.

A TAZ is identified as a location of EJ concern if it has a minority population percentage at or above the lesser of the regional average or the national average, and/or a population in poverty whose percentage of the full TAZ is at or above the lesser of the regional average or the national average.

Demographic and socioeconomic data will change over the life of *AIM Forward 2040*. Based on the latest available data, however, a location is identified as an EJ area if it meets either or both of the following criteria:

- Percent of residents of minority status at or above 28.81%
- Percent of residents below the poverty level at or above 14.72%

These values represent the more stringent test between national and regional levels, as depicted in Figure 5.2-1 below.

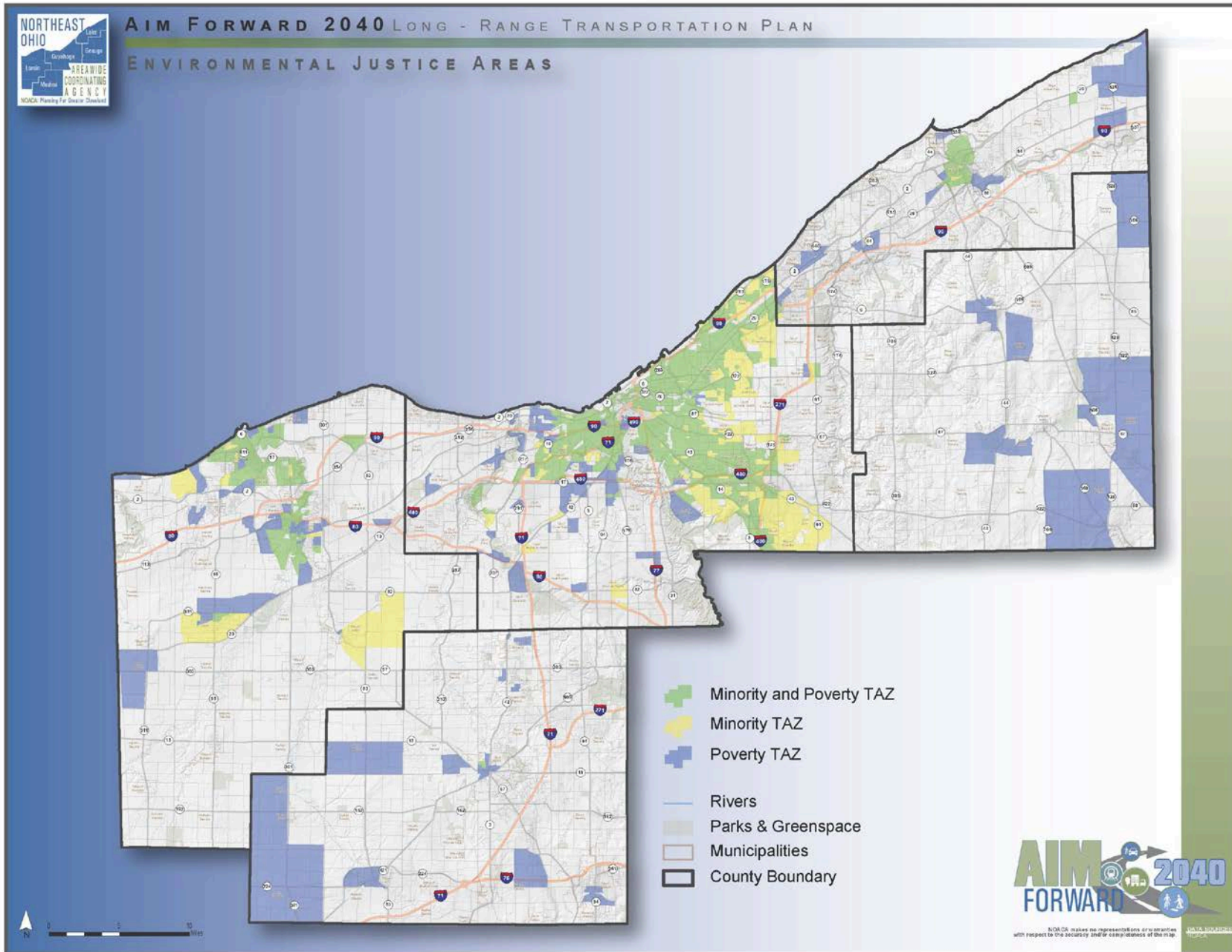
Figure 5.2-1: Minority and Poverty Levels in the U.S. and in the NOACA Region

Environmental Justice Element	U.S.	NOACA
Minority Status		
Percentage Minority	37.23%	28.81%
Poverty		
Percent Below Poverty Level	14.72%	14.84%

Sources: American Community Survey, 2010-2014 5-Year Estimates,
American Community Survey 2015 1-Year Estimates

Figure 5.2-2 depicts which TAZs meet one or both of these criteria.

Figure 5.2-2: Environmental Justice Areas in the NOACA Region



Policies

Projects that will be implemented in environment justice areas are subject to the following benefits:

- Sponsors may be eligible to apply for financial assistance for preliminary engineering for transportation projects.
- Sponsors may apply for federal funds for right-of-way acquisition, less the initial \$50,000 right of way investment typically required.
- Project sponsors are eligible to request 100% NOACA funding participation, using 20% funding from toll credits.
- Sponsors may be eligible for other programs that may be conceived of in the future.

Project Impacts

As seen in Figure 5.2-3, the majority of *AIM Forward 2040*'s major projects are located in or near environmental justice areas. With the exception of the Opportunity Corridor project, however, these projects are rehabilitations or enhancements of existing portions of the federal-aid system. As the benefits of these projects should accrue to all users of the system, NOACA determines that they pose no adverse impacts on the environmental justice populations.

Opportunity Corridor is a uniquely challenging project to evaluate for environmental justice impacts. Its course traverses an area referred to as the "forgotten triangle." It contains both a significant number of minority and low-income populations. Early in its development, there were concerns that it would travel through this area without doing anything to benefit its current residents. This would likely have been an adverse impact on the environmental justice populations; however, the City of Cleveland and the Ohio Department of Transportation (ODOT) have worked closely to ensure that the project will deliver benefits to the forgotten triangle. The outcomes of their efforts should mitigate any adverse impacts the project might otherwise have caused.

5.3: Transportation Conformity

Introduction

All regions designated as nonattainment or maintenance areas for the National Ambient Air Quality Standards (NAAQS) related to mobile emissions—specifically ozone (O₃), coarse particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), and carbon monoxide (CO)—are required to demonstrate that emissions resulting from planned transportation system improvements will not exceed an area's motor vehicle emissions budgets (MVEBs). This requirement is known as transportation conformity. The U.S. Department of Transportation (US DOT) issues nonattainment areas formal transportation conformity determinations following a quantitative analysis that demonstrates that emissions from vehicles traveling on the planned transportation system are less than the area's MVEBs (or other emission target in the absence of an approved budget). Transportation conformity determinations ensure that the transportation sector is contributing to an area's progress toward meeting national air quality standards.

The metropolitan planning organizations (MPOs) in Ohio and the Ohio Department of Transportation (ODOT) must establish conformity for the 2006 and 2012 PM_{2.5} NAAQS and the 1997 and 2008 8-hour O₃ NAAQS when adopting new long-range transportation plans and/or Transportation Improvement Programs (TIPs). Because conformity is determined at the level of the nonattainment/maintenance area rather than at the sub-area level, each of the area's planning partners must approve a new conformity finding for the area based on these updates.

The analyses for O₃ and the 2006 PM_{2.5} NAAQS cover the pertinent portions of the counties of Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit. In contrast, the analysis for the 2012 PM_{2.5} NAAQS includes only Cuyahoga and Lorain counties, as they were the only counties included in the region's moderate nonattainment area for this standard. The analysis for the 1997 and 2008 O₃ NAAQS is based upon the MVEB developed for the 1997 NAAQS. The analyses for the 2006 and 2012 PM_{2.5} NAAQS are based on the budgets outlined for the 1997 and 2006 PM_{2.5} maintenance plans, which the Ohio Environmental Protection Agency (Ohio EPA) developed. The current analyses reflect a comparison of projected transportation emissions against the approved or submitted budgets for each standard. All analyses used the MOVES2014, an approved emissions modeling tool from US EPA.

The projects identified in Figure 5.3-1 were considered in the conformity analyses for *Aim Forward 2040*. The summary of the analyses follows the table.

These tests are required because all areas with a current or former designation of nonattainment must maintain conformity findings for the designated pollutants. The tests ensure that transportation planning efforts do not hinder efforts to bring the area into attainment of the standards or maintain attainment of the standards.

Figure 5.3-2 through 5.3.4 show test results. For all tests, projected emission levels are beneath the respective MVEBs, demonstrating conformance with the goals of the Clean Air Act.

Figure 5.3-1: Aim Forward 2040 - Transportation Conformity Highway Networks Summary

2020:	In addition to the existing system, and the projects identified in the network, the 2020 network contains the following additional capacity projects that will be open by 2020.	
County	Project Description	PID
Cuyahoga	Bagley/Pleasant Valley Road: From Pearl Road to York Road	10900
Cuyahoga	CCG2 EB BRIDGE: I-90 from I-90/490 to East 9th Street overhead	82119
Cuyahoga	Clemens Road: Construct a Clemens Road by-pass and a exclusive southbound right turn lane for the I-90 WB ramp	85297
Cuyahoga	I-271: From Cuyahoga County line to Columbus Road	80418
Cuyahoga	SR 82 (East Royalton Road): West 130th Street to York Road	80961
Cuyahoga	GGC6A: I-77 widening and replacing the I-77 bridge over I-490	13567
Cuyahoga	CCG6B Broadway – I-77: Remove and build a new longer bridge for SR 14 over I-77. Reconstruct ramps. New frontage road from Broadway to Pershing Avenue to access to I-77 southbound.	82388
Cuyahoga	SR010-20.98: Cleveland: (Opportunity Corridor Section 2A) New Construction from East 93rd Street to Quebec Avenue (Construct new bridge over N & S RR and GCRTA. Extend platform and install ADA compliant stair elevator core at GCRTA East 105th Street and Quincy Red Line Station (Design Build). PROJECT SPLIT FROM PID No. 96833: CUY IR 490/SR 010-02.09/19.19 (Related PID No. 77333)	98695
Cuyahoga	SR010-21.49: Cleveland: Quebec Avenue to US 322 (Chester Avenue) Widen and reconstruct East 105th St (SR 10) from Quebec Avenue to Chester Avenue in the City of Cleveland. Section 1 of the Opportunity Corridor. PE and RW under PID 77333; related PIDs 7733, 96833 and 98695.	96832

2020 (continued):	In addition to the existing system, and the projects identified in the 2015 network, the 2020 network contains the following additional capacity projects that will be open by 2020.	
County	Project Description	PID
Cuyahoga	I-77 Widening: Add a lane from CUY SCL to south of Oakes Road	79671
Cuyahoga	IR 490/SR 010-02.09/19.19: (Opportunity Corridor Section 2B) West of E 55th Street to Quebec Avenue (Related PID No. 77333)	96833
Lake	Heisley Road Phase III: Jackson Street to US 20 (Mentor Avenue)	89047
Lake	Crile Road Connector: From Auburn Road to Crile Road	89046
Lorain	US 20 (Center Ridge Road): From Stony Ridge Road to Lear Nagel Road	82632
Lorain	SR 57: From I-90 to the Ohio Turnpike I-80 ramps	82645
Medina	US 42 (Pearl Road) 19.33: Intersection improvement at US 42 and Fenn Road (related PID 75995)	86893
Medina	US 42 (Pearl Road) 17.68: Reconstruction and add lanes on US 42 Harding Street to Fenn Road (related PID 75995)	92954
Medina	MED SR018-13.54: Medina Twp., Montville Twp.: SR 18-13.54 (Foote Road) to 15.15 (Nettleton Road) Widen to 5 lanes from Foote Road to River Styx and 7 lanes from River Styx to Nettleton Road (Project is related to PID No. 76946 MED SR-18 MED SR 0018 13.00)	92953

Figure 5.3-1: Aim Forward 2040 - Transportation Conformity Highway Networks Summary (continued)

2022:	In addition to the existing system, and the projects identified in the 2020 network, the 2022 network contains the following additional capacity projects that will be open by 2022.	
County	Project Description	PID
Cuyahoga	Transportation Blvd. Extension: From I-480 to Rockside Road	85395
Cuyahoga	SR 82-10.17: Broadview Heights: East of SR 176 (Broadview Road) to Treeworth Blvd. Widen a section SR 82, from three lanes to five lanes, from east of Broadview Road (SR 176) to Treeworth Boulevard.	96947
2030:	In addition to the existing system, and the projects identified in the 2020 and 2021 networks, the 2030 network contains the following additional capacity projects that will be open by 2030.	
County	Project Description	PID
Cuyahoga	SR 237/Hopkins Airport: Upgrade Berea freeway ramp access to Cleveland Hopkins Airport	23051
Cuyahoga	CCG3A E 22ND ST: Innerbelt CCG3: Improve I-90 in the “Central Interchange” area between East 9th Street and East 22nd Street; improve East 22nd Street using part-width construction; remove the Cedar Avenue bridge over I-90; improve I-77 north of the Kingsbury Run Bridge; and replace the Carnegie Avenue bridge over I-90 using part-width construction. This project includes all work previously contained in PID No. 82382 (CUY INNERBELT CCG3C Carnegie) and PID No. 80406 (CUY INNERBELT CCG3B IR-77).	82380
Cuyahoga	CUY IR 480 18.42 L&R Deck: Replace the decks of the twin I-480 (“Valley View”) bridges and construct a new four lane structure, between the existing bridges, over the Cuyahoga River Valley in Valley View and Independence.	90591

Figure 5.3-1: Aim Forward 2040 - Transportation Conformity Highway Networks Summary (continued)

2040:	In addition to the existing system, and the projects identified in the 2015, 2020, 2022 and 2030 networks, the 2040 network contains the following additional capacity projects.	
County	Project Description	PID
Cuyahoga	CCG4E CURVE: Innerbelt Trench to East Shoreway, relocation of the Innerbelt Curve	77413
Cuyahoga	CCG5B EB PAVEMENT: EB Innerbelt Trench from East 22nd Street to Superior Avenue	25795
Cuyahoga	CCG5C WB PAVEMENT: WB Innerbelt Trench from East 22nd Street to Superior Avenue	86746
Cuyahoga	INNERBELT CCG4C NS RR: (South of the Innerbelt Curve) Construct a new overhead Norfolk Southern RR Bridge at a new location to accommodate the realignment of the Innerbelt Curve. This structure will replace the existing structure. PROJECT SPLIT FROM CUY INNERBELT RAILROAD BRIDGES GRP5: PID No. 80408	86744

Figure 5.3-2: 2008 Daily 8-Hour Ozone Standard

Attainment status: 2008 8-Hour Ozone standard—maintenance area (Federal Register / Vol. 82, No. 4 / Friday, January 6, 2017)
 1997 8-Hour Ozone Standard—maintenance area (Federal Register Notice Final Rule 9/15/09)

SIP Status: **Federal Register** /Vol. 78, No. 53 /Tuesday, March 19, 2013 – direct final rule adequacy finding for MOVES based 1997 Ozone standard MVEBs
 No submittals required under 2008 8-Hour Ozone standard until approved budgets are received. The budgets found adequate for the 1997 standard will satisfy both 1997 and 2008 tests for the time being per US EPA.

8-Hour Geography: ATB, CUY, GEA, LAK, LOR, MED, POR, SUM Counties, OH

Conformity Tests: 1997 Standard 8-Hour budget tests

Analysis Years: 2015 1st Analysis year (a year in the current TIP)
 2020 Interim year
 2030 Interim year
 2040 Plan(s) horizon year

8-Hour Ozone Test	2020 8-Hour Budget	2020 Emissions	2030 8-Hour Budget	2030 Emissions	2040 Emissions
AMATS					
VOC		6.22		4.20	3.74
NOx		9.37		5.24	4.17
NOACA					
VOC		21.13		13.57	7.57
NOx		26.09		11.71	7.88
Ashtabula Co.					
VOC		0.93		0.58	0.54
NOx		1.56		0.84	0.72
Totals					
VOC	38.85	28.28	30.80	18.35	11.86
NOx	61.56	37.03	43.82	17.80	12.77

Figure 5.3-3: 1997 and 2006 Annual PM_{2.5} Standard

Attainment/ **Federal Register** / Vol. 78, No. 144 / Friday, July 26, 2013 – Proposal to redesignate

SIP Status: Cleveland Area to attainment for 1997 and 2006 PM_{2.5} Standards – FR notice included an adequacy finding for the MOVES based MVEBs

Geography: CUY, LAK, LOR, MED, POR, & SUM Counties & Ashtabula Twp., ATB County, OH

Conformity Tests: Budget tests

Analysis Years: 2015 PM_{2.5} Budget Year and year in current TIP
 2022 PM_{2.5} Budget Year
 2030 Interim year
 2040 Plan(s) horizon year

PM _{2.5} Test	2015 Budget	2020 Emissions	2022 Budget	2022 Emissions	2030 Emissions	2040 Emission
AMATS	tons / year					
Direct PM		155.61		133.40	106.37	107.20
NOx		3,189.25		2,730.52	1,864.41	1,657.69
NOACA						
Direct PM		586.88		506.00	367.70	321.49
NOx		13,606.14		11,532.80	6,329.25	4,107.97
Ashtabula Twp.						
Direct PM		2.59		2.19	1.68	1.68
NOx		60.48		50.33	35.26	32.81
Area Totals						
Direct PM	1,371.35	745.08	880.89	641.59	475.75	430.37
NO	35,094.70	16,855.87	17,263.65	14,313.64	8,228.92	5,798.47

Figure 5.3-4: Annual PM_{2.5} 2012 Standard

Attainment status: PM_{2.5} Moderate Nonattainment Area (80 FR 2205 / January 14, 2015 – Cuyahoga and Lorain Counties designated moderate nonattainment area for 2012 Standards)

SIP Status: Attainment demonstration not due at this time

Geography: Cuyahoga and Lorain County, OH

Conformity Tests: 1997/2006 SIP Maintenance Plan Budget - CUY & LOR subset - tests

Analysis Years: 2021 Attainment year – 1st Analysis year
 2022 Budget year
 2030 Interim year
 2040 Plan(s) horizon year

PM_{2.5} Test	2015* Budget	2021 Emissions	2022* Budget	2022 Emissions	2030 Emissions	2040 Emissions
NOACA						
Direct PM	659.35	378.36	463.02	376.10	267.11	233.09
NOx	18,202.07	9,119.20	8,957.18	8,463.95	4,544.80	2,888.83
*Cuyahoga and Lorain County budget totals from the 1997/2006 PM _{2.5} SIP Maintenance Plan						

