Long Range Transportation Plan 2050

MAY 2021

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Regional Planning Commission

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2050 LONG RANGE TRANSPORTATION PLAN

Adopted: May 6, 2021

Miami Valley Regional Planning Commission
10 North Ludlow Street
Suite 700
Dayton, Ohio 45402

This document is the product of a study financed by the U.S. Department of Transportation (U.S. DOT), the Ohio Department of Transportation (ODOT), and the Miami Valley Regional Planning Commission.

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RESOLUTION
ADOPTING THE 2050
LONG RANGE TRANSPORTATION PLAN

WHEREAS, the Miami Valley Regional Planning Commission is designated as the Metropolitan Planning Organization (MPO) by the Governor acting through the Ohio Department of Transportation in cooperation with locally elected officials for Greene, Miami, and Montgomery Counties including the jurisdictions of Carlisle, Franklin, Springboro, and Franklin Township in Warren County; and

WHEREAS, the MVRPC's Board of Directors serves as the policy and decision making body through which local governments guide the MPO's transportation planning for the Dayton Metropolitan Area; and

WHEREAS, the MVRPC currently conforming 2040 Long Range Transportation Plan (Plan) was adopted in May 2016; and

WHEREAS, the Fixing America's Surface Transportation Act (FAST Act) requires that the Plan be comprehensively updated every five years; and

WHEREAS, the updated 2050 Long Range Transportation Plan is the result of a coordinated effort that reflects federal requirements and regional priorities; and

WHEREAS, the updated 2050 Long Range Transportation Plan is fiscally constrained; and

WHEREAS, the MVRPC current SFY2021-2024 Transportation Improvement Program (TIP) is consistent with the updated 2050 Long Range Transportation Plan; and

WHEREAS, the conformity process completed for Greene, Miami, and Montgomery Counties in the Dayton/Springfield Air Quality Region meet the Clean Air Act and Transportation Conformity rule requirements for the 1997 ozone standard; and

WHEREAS, significant TIP projects in Franklin, Carlisle, Springboro, and Franklin Township have been included in the regional emissions analysis for the Cincinnati Region and found to conform to the 2008 and 2015 8-hour ozone standards; and

WHEREAS, the MVRPC's 2050 Plan conformity determination is made consistent with the April 2012, U.S. EPA Transportation Conformity Regulations.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Miami Valley Regional Planning Commission hereby adopts the 2050 Long Range Transportation Plan.

BY ACTION OF THE Miami Valley Regional Planning Commission's Board of Directors.

Brian O. Martin

Brian O. Martin, AICP
Executive Director

Date: May 6, 2021

Chris Mucher, Chairperson
Board of Directors of the
Miami Valley Regional Planning Commission

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CHAPTER 1

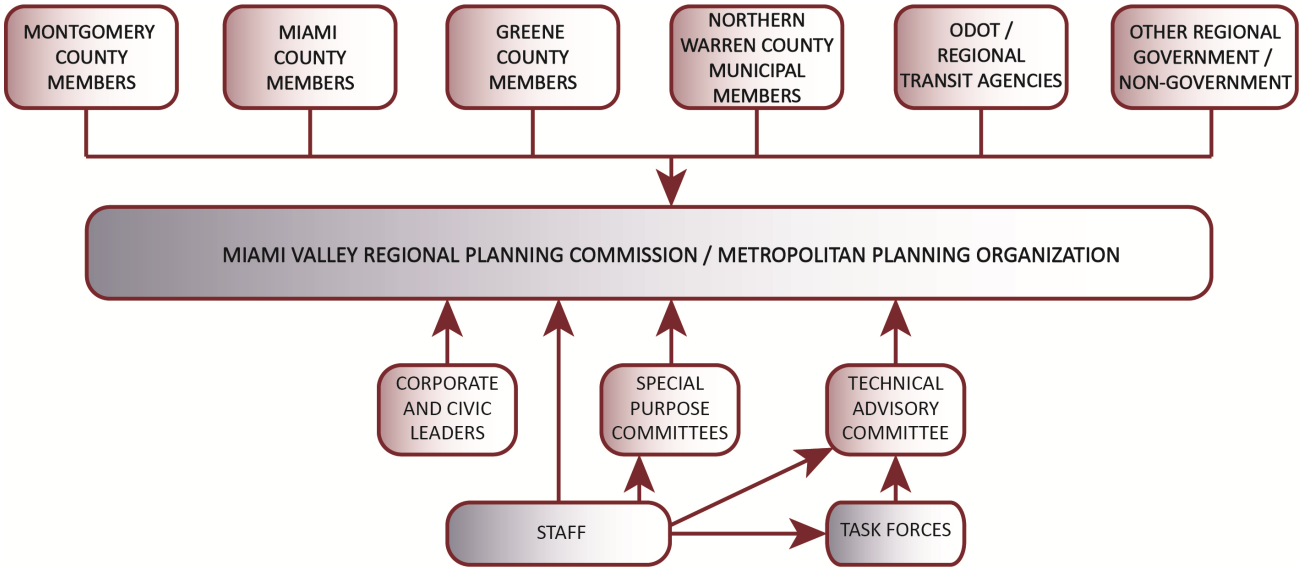
INTRODUCTION

1.1 Transportation Program Structure

The Miami Valley Regional Planning Commission (MVRPC) is the Regional Planning Commission for Darke, Greene, Miami, Montgomery, and Preble counties in west-central Ohio. MVRPC is also the Metropolitan Planning Organization (MPO) for Greene, Miami, and Montgomery counties, the cities of Carlisle, Franklin, and Springboro, and Franklin Township in Warren County (hereafter referred to as northern Warren County) (see Figure 1.2). As such, MVRPC is responsible for developing, implementing, monitoring, and updating a variety of transportation plans that are designed to enhance the Region's competitive position, promote regional growth, improve personal mobility, and preserve the environment.

Figure 1.1 gives a brief overview of the transportation program structure at MVRPC.

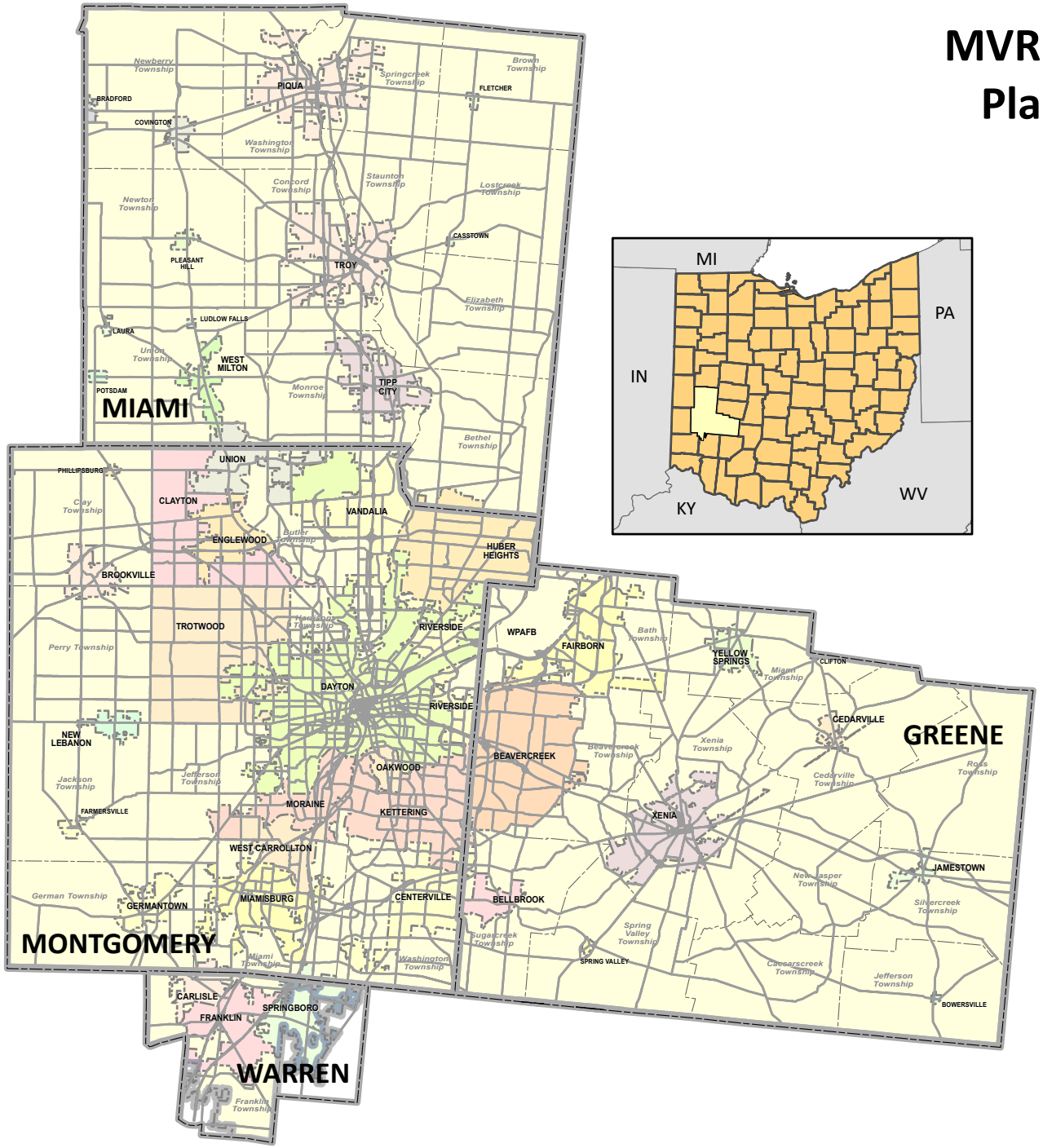
Figure 1.1 — MVRPC Transportation Program Structure



The MVRPC Board of Directors is the policy-making body and consists of local elected officials from the member jurisdictions throughout the Region. The Board also includes representation from corporate and civic leaders, the Ohio Department of Transportation (ODOT), and the regional transit systems. The Board of Directors meets regularly and receives input from the Technical Advisory Committee (TAC) and/or other special committees to make decisions regarding the Regional Planning Commission and the MPO. Only those members of the Board of Directors that are members of the MPO can act on MPO-related issues, such as the adoption of the Long Range Transportation Plan.

MVRPC

Figure 1.2
MVRPC Transportation Planning Area Map



Metropolitan Planning Organization Boundary

Source: MVRPC

May 2021

N

0 2 4 6 8 Miles

The TAC is a permanent committee composed primarily of transportation professionals from local jurisdictions and counties, ODOT, transit systems, and other government districts. Together they review and provide technical assistance and make recommendations to the Board on transportation-related projects and programs planned for the Miami Valley Region. Special task forces serve a specific purpose by examining requests for modifications to previously adopted access control plans, thoroughfare plans, and other plans. Technical representatives from the jurisdictions that are likely to be affected by the modification(s) use input from these groups to make well-informed decisions on transportation plans that will affect the Region for years to come.

MVRPC technical staff (planning, engineering, and GIS) generate forecasts, system alternatives, recommendations, and reports for subsequent review and action by the Board of Directors.

1.2 Long Range Transportation Plan Overview

The Long Range Transportation Plan (LRTP) is a long range (20+ year), multimodal strategy and capital improvement program developed to guide the effective investment of public funds in transportation facilities. The LRTP is updated every five years, and may be amended as a result of changes in projected Federal, State, and local funding; major investment studies; the congestion management process; interstate interchange justification/modification studies; environmental impact studies; and federal or state legislation. The LRTP provides the context from which the Region's Transportation Improvement Program (TIP), a capital improvement program for implementing highway, transit, and other multimodal projects, is drawn.

MVRPC last conducted a comprehensive update of its LRTP in 2016, focusing on highway, transit, and bicycle/pedestrian transportation improvements desired between 2016 and 2040. Since the adoption of the LRTP in May 2016, MVRPC staff has worked on the data collection, analysis, and program development necessary to update it. The new plan, titled the 2021 Update to the 2050 Long Range Transportation Plan (hereafter 2050 LRTP or the Plan), adopted on May 6, 2021, is a 30-year multimodal transportation plan with a base year of 2010 and a planning horizon year of 2050. The 2050 LRTP reflects active involvement by the elected officials, engineers and planners of the MPO's jurisdictions and member agencies, as well as input from the business community, general public, and special interest groups. This update also reflects current and projected land uses, demographics, economic conditions, traffic conditions, environmental analyses, and local/State/Federal priorities, so that the Plan can be actively used and referred to by local decision makers.

There have been numerous new initiatives incorporated into the 2050 LRTP update. The Plan includes a discussion on the latest Federal Transportation law — the FAST Act and the performance management approach compliance requirements. In 2019, MVRPC's Project Evaluation System (PES) was updated to better align the project selection and evaluation criteria with the type of projects that are currently being funded and to incorporate equity criteria and a performance management approach.

MVRPC conducted a basic accessibility services analysis for vulnerable populations and incorporated the results into the Community Impact Assessment (**Chapter 10**). The Plan also includes results from an ODOT-commissioned pedestrian crash risk assessment study that identifies locations in the Miami Valley where conditions exist for pedestrian crashes to occur. For the 2050 LRTP Update, MVRPC also updated its regional report card based on latest safety, congestion, mobility, and land use data. Finally, the Plan includes an extensive discussion on climate change in the environmental planning chapter (**Chapter 9**).

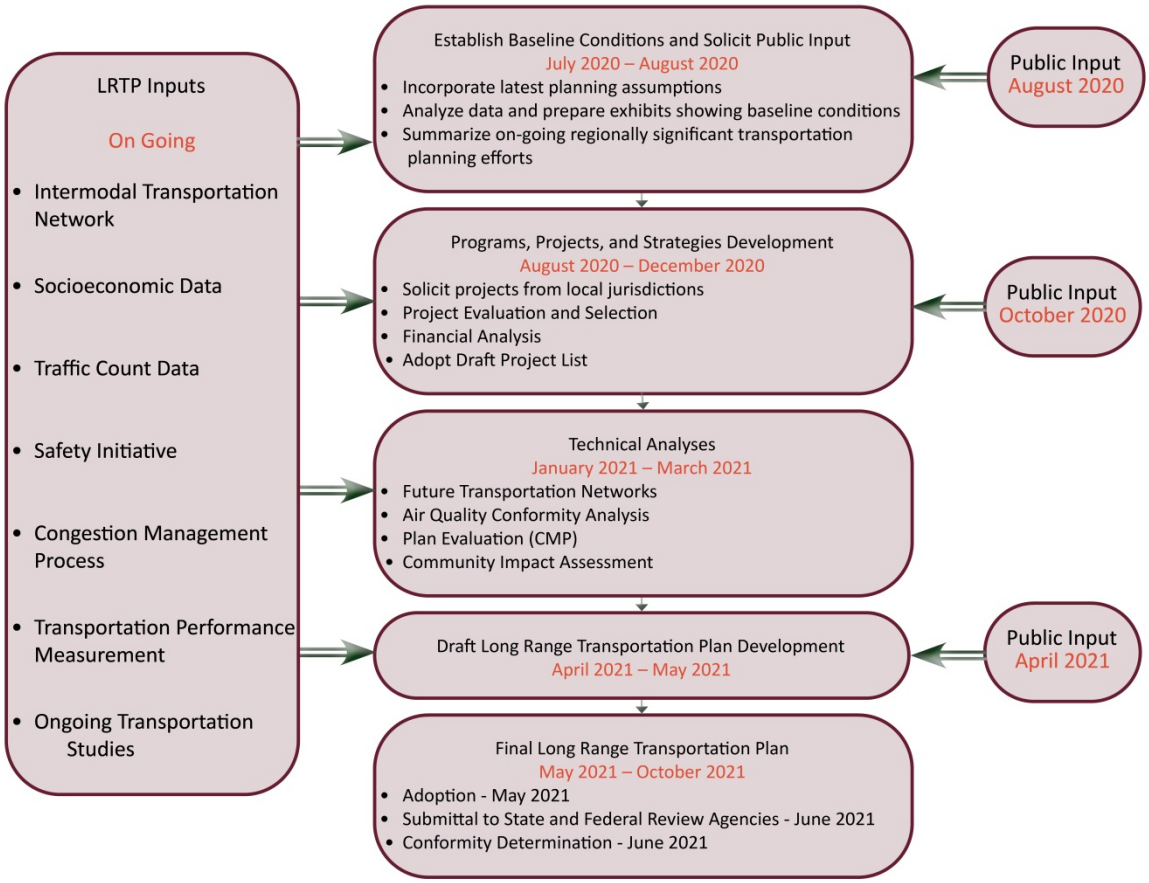
Owing to the COVID-19 pandemic, MVRPC had to make appropriate modifications to its Plan development process by shifting all consultation and coordination processes, including public participation meetings, to the virtual environment. Zoom meetings, emails, and the Plan website were utilized to communicate with stakeholders. At the same time, suitable accommodations were also made for non-internet users as described in **Chapter 11**.

The process for preparing the 2050 LRTP included several steps as shown in Figure 1.3. MVRPC started the update process by collecting data for the base year transportation and land use conditions to be used for transportation modeling and analysis purposes. Data collection was an on-going process throughout the update and included gathering several types of data – highway and transit networks, socioeconomic data, traffic counts, transportation performance measures and targets, and major studies conducted in the Region.

Following the data collection effort, MVRPC prepared exhibits displaying background transportation, socioeconomic, and land use information for the 2050 LRTP Update. The socioeconomic and land use data analysis is presented in **Chapter 3** of this report. A virtual public participation meeting was held in August 2020 to present the background information pertaining to the Plan.

Between August and December of 2020, MVRPC carried out the projects, programs, and strategies development process whereby MVRPC solicited projects from local jurisdictions. The draft (not-fiscally-constrained) project list that resulted from the solicitation process was presented to the public in two virtual meetings in October of 2020. After taking note of public input and working with project sponsors, MVRPC staff completed the project evaluation process to develop a fiscally-constrained proposed project list. The proposed project list was adopted by the Board of Directors in December 2020. **Chapters 4 to 7** of this report provide detailed information on projects, programs, and strategies.

Figure 1.3 — 2050 Long Range Transportation Plan Update Process Overview



Based on the proposed project list and the previously gathered transportation, socioeconomic, and land use data, MVRPC completed the required plan analyses between January 2021 and March 2021. Travel demand forecasts were produced for various scenarios, including: the base year (2010); the horizon year assuming implementation of existing and committed projects only (2050 E+C); and the horizon year assuming the implementation of all congestion management projects in the Plan (2050 Plan). All regionally significant congestion management projects were analyzed for potential environmental impacts and possible mitigation measures were suggested. Community impact analysis was also conducted to identify and address environmental justice issues. Analyses conducted as part of the 2050 LRTP update are explained in further detail in **Chapters 4, 9 and 10**. **Chapter 8** documents the FAST Act requirements for implementing performance management as part of the metropolitan transportation planning process, and provides a summary description of the performance measures and targets applicable to the MVRPC MPO Region.

MVRPC held a final virtual public participation meeting in April 2021 to present the draft 2050 LRTP update to the public for their input and comments. The final draft Plan was also presented to the TAC for their recommendations and comments. The 2021 Update to the Long Range Transportation Plan was adopted on May 6, 2021 by the MVRPC Board of Directors. Following the adoption of the Plan by the Board, the draft report was submitted to ODOT, U.S. Environmental Protection Agency (U.S. EPA), Federal Highway Administration (FHWA), and Federal Transit Agency (FTA) for their review and approval.

As described above, MVRPC made extensive public outreach efforts in every step of the 2050 LRTP update process to increase the likelihood of public participation. Public participation efforts are summarized in **Chapter 11** of this report.

1.3 Transportation Goals and Objectives

MVRPC's transportation goals and objectives were redefined in 2003 as a result of a community-based visioning process known as TransAction 2030. The objective was to identify the collective transportation values of the communities in the Region and develop a shared transportation vision, along with measurable criteria that could be applied to potential projects to gauge their consistency with the vision. TransAction 2030 involved soliciting input from stakeholders in the Region by applying various tools and methods. Based on this input, transportation goals were identified and incorporated into the MVRPC Strategic Plan. In May of 2007, MVRPC revised the Plan's goals and objectives to incorporate "security" into its transportation system management objective as per SAFETEA-LU requirements.

The Board of Directors reaffirmed the goals and objectives for use in the 2021 LRTP update in October 2020. The transportation goals are included in MVRPC's Strategic Plan under the larger umbrella of Regional Stewardship, Vibrant Communities, Partnerships (Vigorous Economy), and Sustainable Solutions.

Regional Stewardship

Develop Regional Priorities — Continue to address regional transportation needs that further the shared social, economic, transportation, and environmental goals of the Region.

Vibrant Communities

Transportation Choices — Encourage a stronger multi-modal network in the Region to ensure that people and goods reach their destination safely, efficiently, and conveniently.

Transportation System Management — Continue to maintain and upgrade the regional transportation system by providing safety, security, aesthetic, and capacity improvements as needed.

Transportation and Land Use — Incorporate regional land use strategies into the transportation policy and the investment decision making process.

Vigorous Economy

Transportation — Continue to address regional transportation needs to enhance economic development in order to attract and retain businesses in the Region while improving the quality of life of its residents.

Sustainable Solutions

Clean Air — Encourage the pursuit of alternative fuels and transportation to reduce emissions and our reliance on petroleum-based products.

1.4 Federal, State, and Local Requirements

MVRPC complies with Federally-mandated planning requirements that the Long Range Transportation Plan is meant to satisfy. An explanation of the requirements is provided in **Chapter 2**.

1.5 Fiscal Constraint

Fiscally constrained lists for highways, transit, and sustainable growth strategies for the 2050 LRTP were developed based on:

- LRTP Project Sponsors;
- Public comments on transportation system needs and opportunities;
- Review by the local jurisdiction's engineers and planners, ODOT Districts, and Transit Agencies; and
- Review by MVRPC staff.

For each mode, the costs of the 2021 through 2050 plan projects are balanced against projected revenues and, following the FAST Act requirements, are expressed in year of expenditure dollars. The fiscal constraint for each transportation mode are summarized in Table 1.1. Extensive documentation of project costs, revenues, and fiscal constraint for highway, transit, and bikeway/pedestrian strategies is provided in **Chapters 5, 6, and 7**, respectively.

Table 1.1 — Fiscal Constraint of the 2050 LRTP Projects (in millions of Year of Expenditure dollars)

Project Type	Total Revenues	Total Cost	Total Revenues - Total Cost
Highway Maintenance/Reconstruction	$4,240.00	$4,240.00	0.00 (Fiscally Constrained)
Highway Operational/Safety/Capacity	$2,959.46	$2,326.89	+$632.57 (Fiscally Constrained)
Transit	$3,810.45	$3,810.45	0.00 (Fiscally Constrained)
Ridesharing/Air Quality	$27.18	$27.18	0.00 (Fiscally Constrained)
Bikeway/Pedestrian	$20.25	$20.25	0.00 (Fiscally Constrained)

Source: MVRPC

1.6 Air Quality Conformity

On March 6, 2015, U.S. EPA published the final rule for the Implementation of the 2008 NAAQS for Ozone: State Implementation Plan Requirements, 80 FR 12264, effective April 6, 2015. The final rule revoked the 1997 ozone standard for all purposes including transportation conformity but on February 16, 2018, the U.S. Court of Appeals for the District of Columbia Circuit on the South Coast II Court Case held that transportation conformity determinations must continue to be made in those areas ("orphan areas"). As an ozone orphan area, and consistent with U.S. EPA's November 29, 2018 guidance and interagency consultation, MVRPC will advance a qualitative Long Range Transportation Plan (LRTP) conformity determination for the Dayton/Springfield Region.

The conformity analysis demonstrates that the transportation programs in the Dayton/Springfield and northern Warren County areas conform to applicable air quality standards. The current air quality status and the associated requirement and procedures by which MVRPC performed the 2050 LRTP update transportation conformity analysis are discussed in detail in **Chapter 9**.

1.7 Project Implementation

All federally and non-federally funded surface transportation projects (that are regionally significant and that increase capacity, extend roadways, or add new roadways) are implemented via the following steps:

- The project must be in the Long Range Transportation Plan;
- The Long Range Transportation Plan must continue to meet financial constraints and air quality conformity;
- The project must be placed on MVRPC's TIP;
- The project receives funding and can move towards implementation.

It is important to note that non-federally funded projects (that are regionally significant and that increase capacity, extend roadways, or add new roadways) are treated the same as federally funded projects because of their potential air quality impacts. Further, ODOT, local jurisdictions, and modal agencies might need to work to break up large projects into smaller, more manageable components (i.e., preliminary engineering, environmental, right-of-way, construction, as well as smaller segments) in order to improve project funding capability and facilitate project development and implementation.

1.8 Amending and Updating the Long Range Transportation Plan

Amendments to the Plan may occur either as part of the comprehensive update (every five years), annual TIP-related updates, or at other times as needed. The comprehensive update is a federal mandate and consists of re-examining the basic assumptions behind the Plan and the resulting projects and strategies. Amendments to the Plan requiring a comprehensive update consist of reassessing:

- Land use, demographic, and economic forecasts;
- Projected traffic and travel deficiencies;
- Financial Analyses (Cost/Revenues);
- Regional Air Quality Analyses; and
- Other aspects of the vision and plan.

Amendments to the Plan requiring a comprehensive update would need to be adopted by MVRPC's Board of Directors, after the opportunity for general public review and comment.

A comprehensive update is normally initiated by staff on a timetable that ensures the continuation of at least a 20 year horizon for the Plan, and that meets the federal update timeframe requirements (currently every 5 years). On those other rare occasions when a comprehensive or major update might be requested by a jurisdiction due to unforeseen changes to a major project or due to drastic and immediate changes in land use/demographics/economics, staff would develop a timeline to conduct the update in a timely manner.

The following outlines the anticipated process for Plan amendments:

- Receive a formal jurisdictional request for a Plan amendment;
- Complete the Project Profile and Evaluation Forms;
- Determine if additional revenues are available to cover the project or modified project;
- If sufficient additional revenues cannot be projected, submit recommendations to redesignate Long Range Transportation Plan projects as non-plan projects; any agreements with other jurisdictions or agencies to redesignate projects should be so noted;
- Submit justification for the amendment.

MVRPC staff would then finalize the project evaluation, review the appropriateness of the proposed amendment, review the financial constraints, conduct the air quality conformity analysis, and make a recommendation for the Board's action.

CHAPTER 2

FEDERAL, STATE, AND LOCAL PLANNING REQUIREMENTS

2.1 The Fixing America's Surface Transportation Act (FAST Act)

On December 4, 2015, the new federal surface transportation bill, the FAST Act, was signed into law. The new bill follows its predecessors, the Safe, Accountable, Flexible, Efficient, Transportation, Equity Act, a Legacy for Users (SAFETEA-LU), and the Moving Ahead for Progress in the 21st Century Act (MAP-21). Both Acts made important contributions to the metropolitan planning process. The FAST Act is the last act with current approved metropolitan planning rules as described in 23 CFR part 450 and reinforces the requirements introduced in MAP-21 for performance based planning.

The metropolitan planning rules state that the planning process shall be continuous, cooperative, and comprehensive, and provide for consideration and implementation of projects, strategies, and services that will address the following planning factors:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Increase the security of the transportation system for motorized and non-motorized users;
- Increase the accessibility and mobility of people and for freight;
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation;
- Emphasize the preservation of the existing transportation system;
- Improve the resilience and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
- Enhance travel and tourism.

The last two factors are additions of the FAST Act. The planning factors are addressed by MVRPC in our numerous planning programs and are summarized throughout the report.

Performance Based Planning

The cornerstone of MAP-21, continued in the FAST Act, was the transition to a performance and outcome-based program. As part of this program, recipients of Federal-aid highway funds would invest resources in projects to achieve individual targets that collectively would make progress toward national goals. Chapter 8

of the 2050 LRTP provides an overview of the transportation performance management process — MPO requirements as stipulated in the FAST Act, as well as a description and summary of all applicable performance measures and targets supported by MVRPC to assess the performance of the Region's transportation system.

2.2 Development and Content of the Regional Transportation Plan

The 2050 LRTP was developed in accordance with 23 CFR 450.324, the required elements are detailed in Table 2.1.

Table 2.1 — Required Transportation Plan Elements

Content and Development Requirements:	How the 2050 LRTP Addresses…
(a) The metropolitan transportation planning process shall include the development of a transportation plan addressing no less than a 20-year planning horizon as of the effective date.	The Plan has a 30-year planning horizon, to the year 2050.
(b) The transportation plan shall include both long-range and short-range strategies/actions that lead to the development of an integrated multimodal transportation system to facilitate the safe and efficient movement of people and goods in addressing current and future transportation demand.	The first four years of Plan projects are referred to as the Transportation Improvement Program (TIP). Both the TIP and the remainder of the LRTP projects include highway, transit, and bikeway/pedestrian projects, as well as travel demand management strategies. The needs of freight transportation are also considered during the project development process as freight dependent industries are heavily represented in the economy of the Miami Valley and Ohio.
(c) The MPO shall review and update the transportation plan at least every five years in air quality attainment areas.	The Plan will be reviewed and updated at least every five years.
(d) In metropolitan areas that are in nonattainment for ozone or carbon monoxide, the MPO shall coordinate the development of the metropolitan transportation plan with the process for developing transportation control measures (TCMs) in a State Implementation Plan (SIP).	While many Transportation Control Measures (TCMs) such as signalization improvements and rideshare programs have been implemented in the Region, there are no TCMs included for credit in the applicable SIPs.
(e) The MPO, the State(s), and the public transportation operator(s) shall validate data utilized in preparing other existing modal plans for providing input to the transportation plan.	The latest planning assumptions as agreed through the interagency consultation process are used in the development of the 2050 LRTP. Those same assumptions were presented to the public and the Board of Directors in the early stages of the Plan development process. Additional details are provided in Chapter 3.
(f) The metropolitan transportation plan shall, at a minimum, include:	
(1) The current and projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan;	MVRPC has coordinated its forecasting methodology and process closely with ODOT's Modeling and Forecasting Section. Based on the latest planning assumptions, the travel demand model forecasts passenger vehicles, commercial vehicles, and transit demand. Additional details are provided in Chapter 3.

Content and Development Requirements:	How the 2050 LRTP Addresses…
(2) Existing and proposed transportation facilities (including major roadways, transit, multimodal and intermodal facilities, pedestrian walkways and bicycle facilities, and intermodal connectors) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions over the period of the transportation plan;	A discussion of existing transportation facilities is included in Chapter 3 of the Plan. Specific strategies and projects are presented in Chapters 4 to 7.
(3) A description of the performance measures and performance targets used in assessing the performance of the transportation system;	A description of the performance measures and performance targets is provided in Chapter 8.
(4) A system performance report and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets;	A system performance summary comparing actual performance to supported targets for each applicable performance measure in the MVRPC MPO region is included in Chapter 8.
(5) Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods;	The Congestion Management Process (CMP), which identifies operational and management strategies to reduce congestion, has been incorporated into the Plan. The CMP also assesses strategies not currently implemented in the Region according to their suitability for future use.
(6) Consideration of the results of the congestion management process in TMAs including the identification of SOV projects that result from a congestion management process in TMAs that are nonattainment for ozone or carbon monoxide;	The results of the regional CMP and other management systems implemented by the State have been incorporated into the Plan.
(7) Assessment of capital investment and other strategies to preserve the existing and projected future metropolitan transportation infrastructure and provide for multimodal capacity increases based on regional priorities and needs, and reduce the vulnerability of the existing transportation infrastructure to natural disasters;	Maintenance and operations of the existing system (plus additions to the system) have been identified as crucial to the Plan. It is assumed in the Plan that the current real value of expenditures for roadway maintenance and operations will continue into the future. The fiscally constrained revenue forecasts for the roadways system outline operations/maintenance and capacity enhancing projects. The transit project lists include operations/maintenance and capacity enhancements.
(8) Transportation and transit enhancement activities, including transportation alternatives;	The TIP includes all funded transportation alternative projects in the MPO.
(9) Design concept and design scope descriptions of all existing and proposed transportation facilities in sufficient detail, regardless of funding source, in nonattainment and maintenance areas for conformity determinations under the EPA's transportation conformity rule;	The 2050 LRTP project lists provide sufficient detail for the modeling of travel demand, air quality conformity, and fiscal constraints; one exception is projects identified as studies since the outcome and particular scope is dependent on the study recommendations.
(10) A discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the metropolitan transportation plan;	Chapter 9 in the Plan includes a discussion of the environmental analysis and potential environmental mitigation activities, including stormwater impacts of surface transportation.

Content and Development Requirements:	How the 2050 LRTP Addresses…
(11) A financial plan that demonstrates how the adopted transportation plan can be implemented.	A conservative financial plan has been developed for each of the 2050 LRTP modal strategies. Only historical and clearly dependable funding source assumptions have been made. The Plan was developed cooperatively with ODOT and the regional transit agencies. As discussed in Chapters 1, 5, 6, and 7, and in detail in the Financial Summary document, the Plan meets the FAST Act mandated fiscal constraint requirement with costs and revenues in year of expenditure dollars.
(12) Pedestrian walkway and bicycle transportation facilities;	Specific regional bicycle and pedestrian projects are listed in Chapter 7 but since the passing of the Regional Complete Streets Policy in 2011, many roadway projects now include bike and pedestrian elements.
(g) The MPO shall consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan.	MVRPC's public participation list has been expanded to include agencies with an interest in the areas of land use management, environmental resources, environmental protection, conservation, and historic preservation. As a result, the list now includes over 700 agencies and individuals. Contacts are notified and given the opportunity to comment on any transportation program that requires action by the MVRPC Board of Directors, such as the LRTP and the TIP. A representative sub-group of these agencies was invited to participate in a survey to gauge the Region's satisfaction with the availability and condition of the existing transportation infrastructure and to set priorities for the future. Chapter 9 in the Plan includes a discussion of the environmental analysis comparing LRTP projects to known inventories of natural and historic resources.
(h) The metropolitan transportation plan should include a safety element that incorporates or summarizes the priorities, goals, countermeasures, or projects for the MPA contained in the Strategic Highway Safety Plan.	Safety is a big component of the transportation planning program at MVRPC. In addition to coordinating with ODOT to ensure consistency with the Ohio Strategic Highway Safety Plan and participating in the annual ODOT District priority safety locations, MVRPC maintains a regional priority list (updated every 3 years) which is used to prioritize funding requests. Safety data and/or safety study assistance is also provided to local jurisdictions upon request. Chapter 4 of this report includes a summary of MVRPC's Safety Initiative.
(i) An MPO may, while fitting the needs and complexity of its community, voluntarily elect to develop multiple scenarios for consideration as part of the development of the metropolitan transportation plan.	MVRPC constructed two alternative scenarios assuming a 50% and 100% connected and automated vehicles (CAVs) fleet by 2050, and used its travel demand model to generate travel and congestion metrics for them for comparison against the other two 2050 non-CAV networks. Chapter 4 has further details.

Content and Development Requirements:	How the 2050 LRTP Addresses…
(j) The MPO shall provide citizens, affected public agencies, representatives of public transportation employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties with a reasonable opportunity to comment on the transportation plan using the MPO's participation plan.	MVRPC's public participation list has been expanded to include over 700 agencies and individuals including all stakeholders, such as affected public agencies, representatives of public transportation employees, freight shippers, providers of freight transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties. Contacts are notified well in advance and given the opportunity to comment on the LRTP both electronically as well as through mail-in comment cards over a one month period. Representatives of freight, public transportation, human services, and pedestrian transportation interests were invited to participate in a survey to gauge the Region's satisfaction with the availability and condition of the existing transportation infrastructure and to set priorities for the future and provide additional input regarding the transportation needs of their respective industries and constituencies.
(k) The metropolitan transportation plan shall be published or otherwise made readily available by the MPO for public review, including (to the maximum extent practicable) in electronically accessible formats and means, such as the World Wide Web.	A user friendly website, plan2050.mvrpc.org, focusing entirely on the Plan update, was available throughout the update process to focus attention on the information most relevant at each stage of the process including all exhibits that were presented at each public participation meeting as well as the ability to comment on the information. In continuation of past trends, the entire Long Range Transportation Plan will be published electronically on MVRPC's website in pdf format and the final congestion management project list will be made available in an interactive map format.
(l) A State or MPO shall not be required to select any project from the illustrative list of additional projects included in the financial plan.	There are no additional projects identified in the Plan as potential needs beyond the 2050 timeframe.
(m) In nonattainment and maintenance areas for transportation-related pollutants, the MPO, as well as the FHWA and the FTA, must make a conformity determination on any updated or amended transportation plan in accordance with the Clean Air Act and the EPA transportation conformity regulations.	The adopting resolution of the 2050 Plan update includes a conformity determination by the MVRPC Board of Directors.

Source: MVRPC

State and Local Coordination

MVRPC worked very closely with ODOT's Modeling and Forecasting section regarding modeling and related activities, including transportation conformity. MVRPC also coordinated closely with ODOT District offices regarding projects under development. Overall, the Plan was developed consistent with ODOT's planning requirements.

The Plan was developed with extensive coordination with the general public, ODOT, and local jurisdictions, including elected officials, agency directors, planners, and engineers.

MVRPC's Long Range Transportation Plan is important to the Region because:

- All federally-funded surface transportation projects need to be drawn or be consistent with the LRTP via MVRPC's Transportation Improvement Program (TIP); and
- The updated Long Range Transportation Plan should be used by local jurisdictions, agencies, and groups to help provide a regional context within which to conduct their long range transportation planning.

It should be understood that local jurisdictions, agencies, and groups developed the 2050 LRTP cooperatively and in a regional fashion. It is hoped that this regional initiative will be incorporated into the planning efforts of the local entities, and that there will be a continuing, cooperative, and comprehensive strategic effort to use the Plan as a guide to other local planning endeavors.

CHAPTER 3

STATE OF THE REGION

3.1 Overview

The Miami Valley Region (hereafter the Region), located in southwest Ohio, is defined as Greene, Miami, and Montgomery counties and the municipalities of Franklin, Franklin Township, Carlisle, and Springboro in northern Warren County. The Region is situated approximately 50 miles north of Cincinnati, 70 miles west of Columbus, and 90 miles east of Indianapolis.

As of 2010, the Region is home to approximately 849,240 people in 1,345 square miles with 82 units of county, city, village, and township governments. Montgomery County is the largest county, with 63% of the Region's total population, and the City of Dayton is the largest city with approximately 141,500 residents. The Region is also home to Wright Patterson Air Force Base (WPAFB), the largest single-site employer in Ohio.

The Region is served by a variety of transportation modal choices. The Dayton International Airport is located in the northern part of Montgomery County and a Greyhound bus terminal is located in Trotwood. Further, an extensive network of roads, transit services, bikeways, and pedestrian facilities provide mobility, accessibility, and connectivity within and outside the Region. Freight infrastructure and facilities support the efficient movement of freight passing through and moving within the Miami Valley.

According to the 2010 Census, the majority of residents in the Region live and work within the same county, although Montgomery County attracts a significant number of its workers from the surrounding counties. The Region is also heavily dependent on personal vehicles, with approximately 93% of work trips made by automobiles averaging a 20.6 minute commute to work.

Under the assumption that the development patterns of the past will remain predominant in the future, it is anticipated that the Region will continue to develop along freeway corridors and their fringes. Overall, the Region's total population is expected to remain virtually unchanged, slightly decreasing by approximately 0.16%, with the eventual stabilization of population loss in the older urban areas, continued growth in the suburbs, and some spillover of that growth into the surrounding rural areas. On the other hand, employment is expected to grow by 17.5% between 2010 and 2050.

The regional Travel Demand Forecasting Model (TDFM) that predicts transportation assignment forecasts based on future assumptions of development patterns has been updated for use in the transportation planning process.

3.2 The Miami Valley Region Today

When the Region was first settled in the late 1700s, urban land uses followed the river valleys, which were the main transportation arteries prior to the development of mechanized forms of transportation. Most of the heavy industries were located along the rivers, which also provided the major source of water.

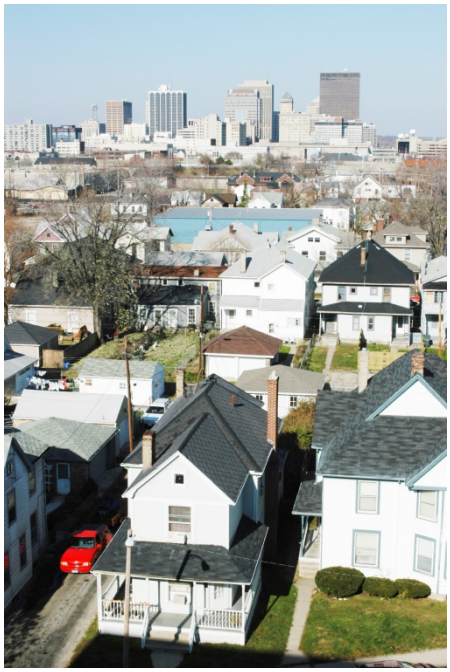
Today, employment is still concentrated in some of the original locations even though the Region's economy has since diversified from its industrial base. Although the current land use patterns in the Region have been shaped more by history than by any inherent physical limitations or advantages, the development patterns of the Miami Valley Region can be characterized as following the main transportation network.

Over the past 55 years, the Region has experienced a drastic change in developed areas characterized by an outward movement from the central city to the suburban areas following Interstates I-75, I-70, and I-675 and US 35, as seen in Figure 3.1. According to the 2010 Census, the urbanized area extends north for 20 miles into the City of Troy in Miami County; east for 15 miles into the City of Xenia in Greene County; south for 15 miles to northern Warren County; and west for 8 miles from the Dayton Central Business District (CBD). Further, the 2010 Census indicates that densely settled areas have emerged in scattered locations throughout the Region.

Land Use

MVRPC used its GIS capabilities along with the latest aerial photography to examine how the land was utilized in the year 2018. Figure 3.2 shows the generalized land use/land cover in 2018.

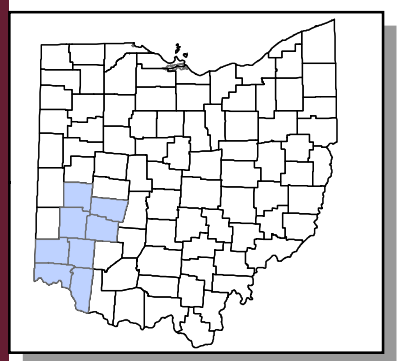
Figure 3.2 shows that residential development in the Region is spread fairly evenly throughout the urbanized area, with high concentrations between the eastern half of Montgomery County and western part of Greene County and along I-75 in Miami County. Since 2000, increased residential development has occurred in northern Warren County as well. The Region's residential development is largely low-density in character.



Commercial development is spread somewhat less evenly, with concentrations around three suburban malls and in the Dayton CBD. Additional commercial areas are found along the major transportation routes, such as Interstates, US Routes, and State Routes, and at the junctions of major roadways, such as the intersection of I-75/I-675, I-70/SR 202, and I-675/SR 48. However, outside of these highly concentrated locations, there is still a mixture of shopping centers, strip center development, and neighborhood shopping districts, with several rural and suburban municipalities also retaining recognizable downtown commercial districts. As a result, most parts of the Region are well served by retail and service facilities.

MVRPC

Figure 3.1
Urbanization Trends: 1950 - 2010



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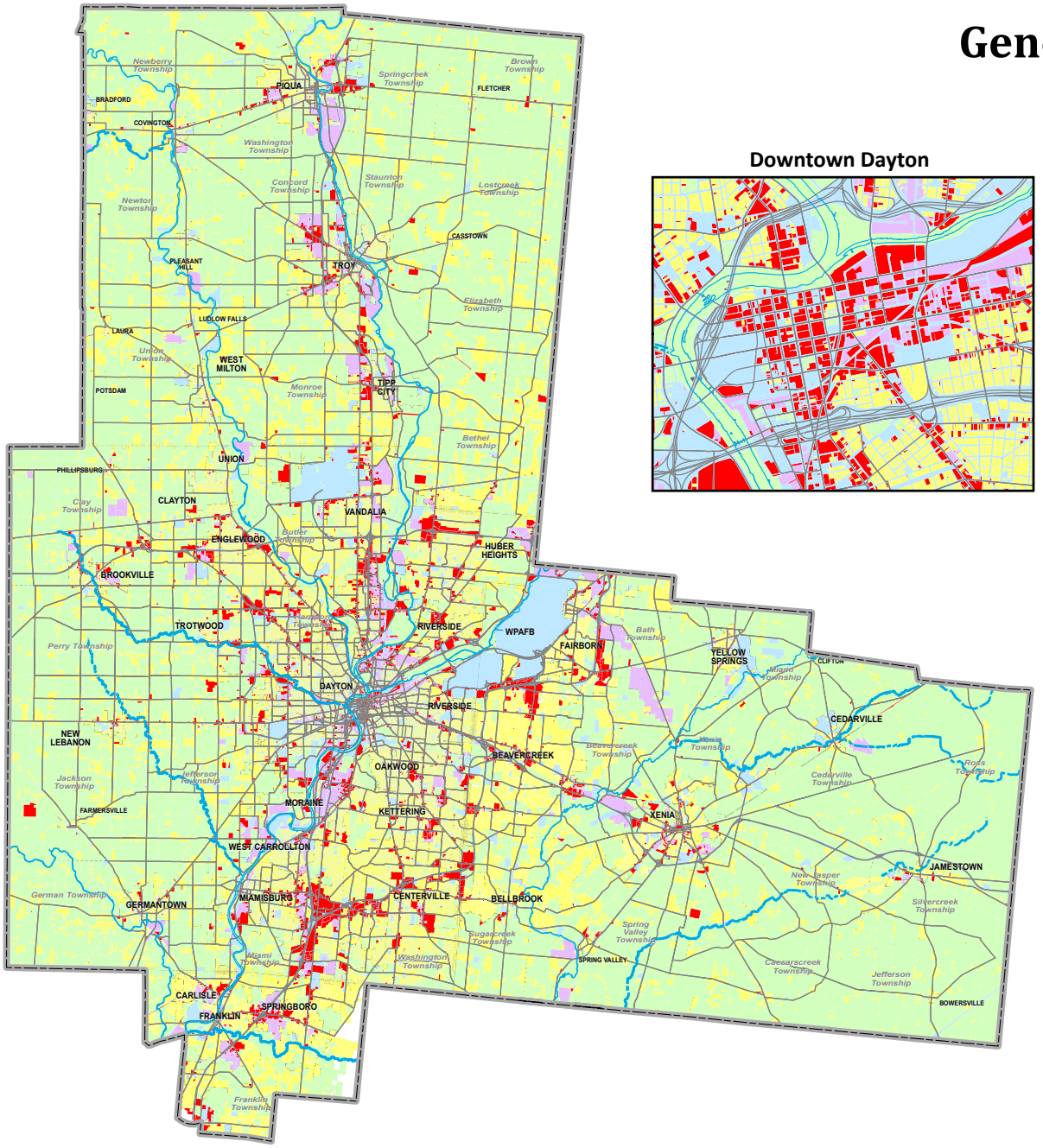
MVRPC

Figure 3.2
Generalized Land Use In 2018



Industrial development in the Region generally follows the I-75 corridor, which parallels the Great Miami River and provides access to major factories and office clusters stretching from the City of Piqua at the northern edge of the Region to the southern Montgomery County border. The most important concentration of employment outside the I-75 corridor is located along the Greene/Montgomery County border, near the intersection of I-70 with SR 4, and along I-675.

Socioeconomic Data

Three main sources of information were utilized to produce socioeconomic variables. For residence-related variables, the Census was the sole source. For employment, MVRPC used a combination of Covered Employment and Wages by Industry data known as ES202 prepared by the Ohio Department of Jobs and Family Services and obtained from the Ohio Department of Transportation, as well as a variety of local sources and knowledge.

Residence-related data were extracted directly from the 2010 Census at the block level and then aggregated to the Traffic Analysis Zone (TAZ). In addition, the 2008-2012 American Community Survey (ACS) data was used for variables unavailable from the 2010 Census products, for example, automobile availability. For employment-related variables, several steps were taken in order to develop base year data. First, the ES202 data obtained from ODOT was geocoded to the TAZ level. Second, in-house databases were used as secondary data sources to complement the ES202 data and fine-tune employment figures. Third, extensive field reviews were conducted throughout the Region for areas with high employment concentrations to verify the locations of individual businesses. Finally, the total employment and employment by 25 industry sectors were generated at the TAZ level following North American Industry Classification System (NAICS) codes. A summary of the Region's socioeconomic data and the percentage share by county is shown in Table 3.1 below.

Table 3.1 — 2010 Socioeconomic Data

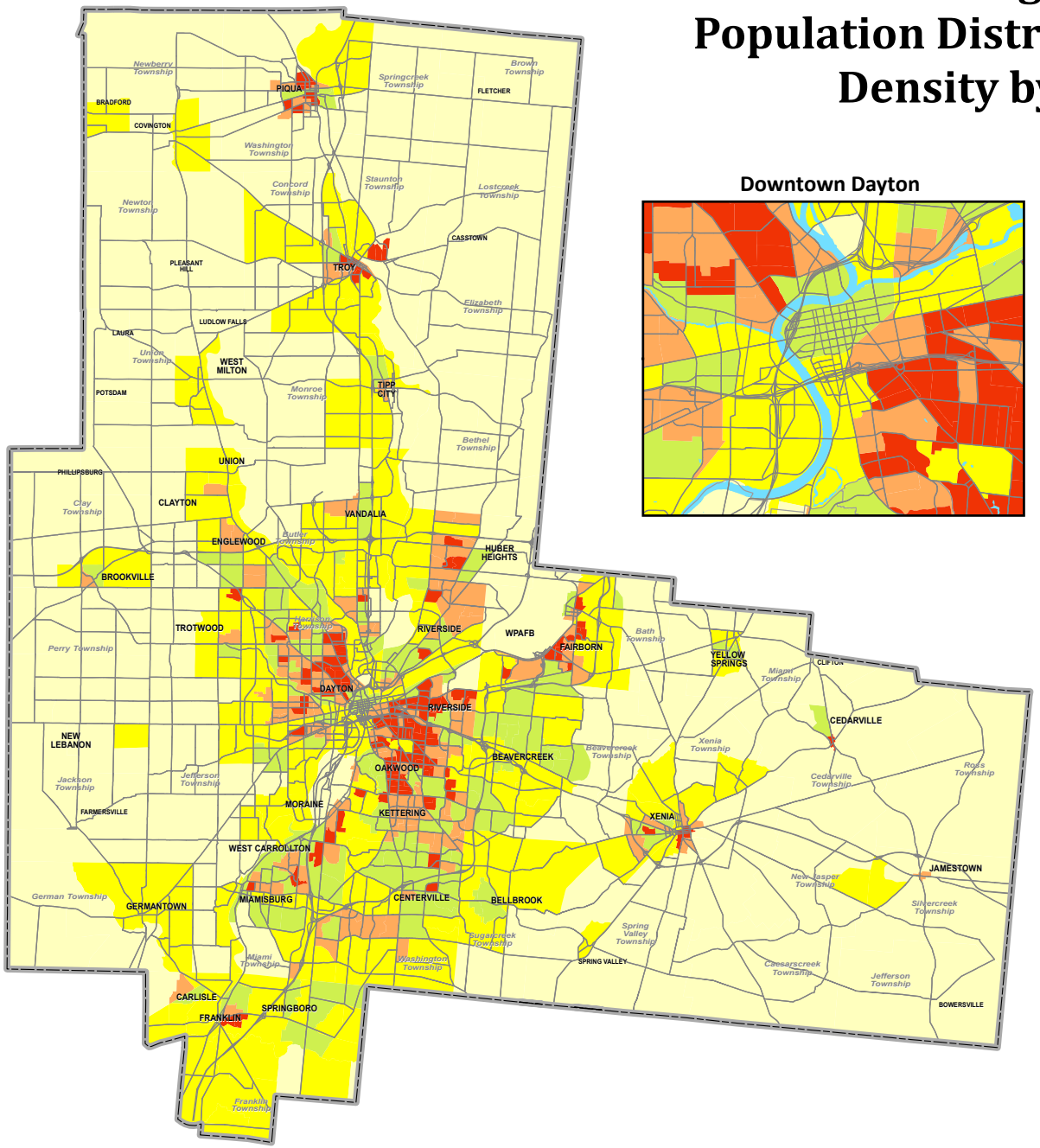
County	Population[1]	Households[1]	Employment[2]
Greene	161,573 (19.0%)	62,770 (18.1%)	97,406 (21.1%)
Miami	102,506 (12.0%)	40,917 (11.8%)	49,607 (10.7%)
Montgomery	535,153 (63.0%)	223,943 (64.7%)	298,018 (64.5%)
Warren*	50,008 (5.9%)	18,463 (5.3%)	16,672* (3.6%)
Total	**849,240**	**346,093**	**461,703**

Note: * Warren County includes only the municipalities of Franklin, Franklin Township, Carlisle, and Springboro. The employment number for Warren County is an aggregate of TAZs because the employment numbers were developed at the TAZ level. The area covered by these TAZs is slightly larger than the area covered by the constituent municipalities.

Source: [1] 2010 Census Summary File 1; [2] MVRPC

MVRPC

Figure 3.3
Population Distribution - Population Density by Block Group



Downtown Dayton

Population per Square Mile

- Low (0 - 300)
- Medium Low (300 - 1,700)
- Medium (1,700 -3,000)
- Medium High (3,000 - 5,000)
- High (5,000 +)

Source: U.S. Census 2010

May 2021

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0 2 4 6 8 Miles

The Region is home to a population of 849,240. The majority of the population, (63%), lives in Montgomery County. However, a closer look at the population density distribution indicates that the Region has significant variations as shown in Figure 3.3. In general, higher population density is observed around the City of Dayton with the density decreasing away from the center and into the surrounding rural areas. Nonetheless, some of the municipalities in the rural areas also have population densities similar to those found inside the urbanized area.

There are approximately 346,000 households in the Region, with 64.7% located in Montgomery County. The household density distribution is similar to the population density distribution; household density is highest in the developed areas in the City of Dayton and in the immediate suburbs, and gradually decreases outward into the rural areas.

The Region is also home to nearly 462,000 jobs. Similar to the population and household distributions, Montgomery County has the largest employment share, with 64.5% of the Region's total employment, followed by Greene (21.1%), Miami (10.7%), and northern Warren (3.6%) counties.

Functional Classification

Approximately every ten years, MVRPC, in cooperation with ODOT, conducts a major review of the existing Functional Classification System following the urbanized area changes made by the Decennial Census. MVRPC completed the most recent update to the functional class system in 2017. MVRPC's regional functional classification system can be seen in Figure 3.4.

According to FHWA, Functional Classification is the grouping of roads, streets, and highways in a hierarchy based on the type of service they provide. Type of service is defined by combinations of mobility and land access as follows:

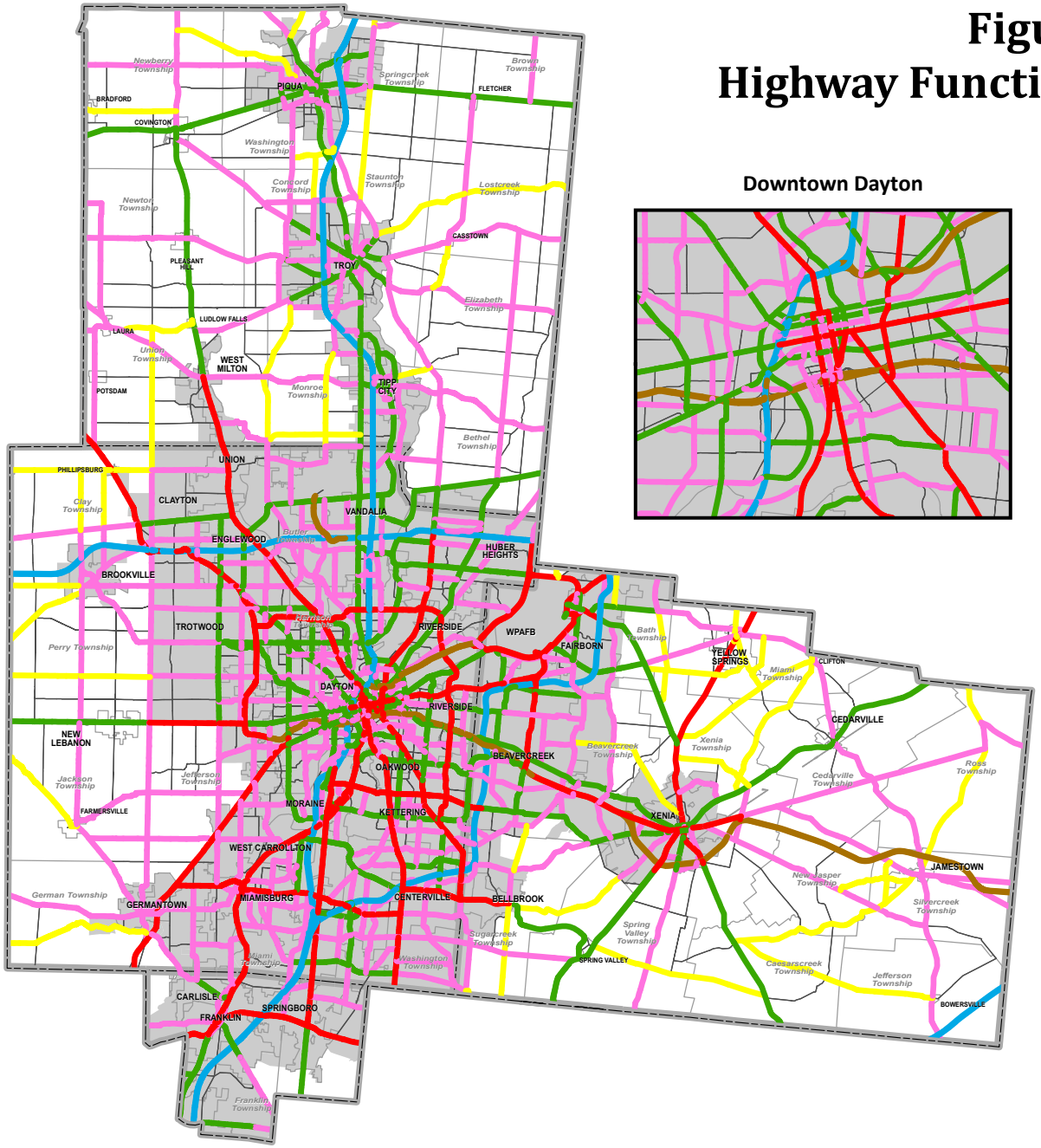
- Arterials include those classes of highway emphasizing a high level of mobility for the through movement of traffic, with land access being a secondary function. Interstates and freeways represent the highest class of arterials.
- As their name indicates, collectors collect traffic from the lower class facilities and distribute it to the higher class facilities. Their function is divided equally between mobility and land access.
- Local streets are located at the bottom of the hierarchy, their primary function being to provide access to adjacent land uses.

Using these three major categories as the base, roads are then subdivided into major or minor as shown in Table 3.2.

It should also be noted that only roadways that are functionally classified as a Minor Collector or above in an urban area or Major Collector or above in a rural area are eligible to use federal funds, the exception being bridges on non-classified roads.

MVRPC

Figure 3.4
Highway Functional Classification



Source: FHWA, ODOT & MVRPC

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Table 3.2 — Functional Classification System

Functional Class
Principal Arterial (Interstate)
Principal Arterial (Freeway/Expressway)
Principal Arterial (Other)
Minor Arterial
Major Collector
Minor Collector
Local

Source: FHWA

Multimodal Transportation System

The Region offers a variety of multimodal transportation opportunities as seen in Figure 3.5. The Region is served by the Dayton International Airport located in the northern part of Montgomery County, three Interstate highways, and a Greyhound bus terminal located in Trotwood.

Together, they connect the Miami Valley Region to other regions in the U.S. by air and ground. Within the Region, a variety of intermodal facilities, such as an extensive transportation network of roads, transit, bikeways, and pedestrian facilities, provide multi-faceted transportation options for better mobility, accessibility, and connectivity. The Region's roadway networks include three interstates (I-70, I-75, and I-675), freeways, and principal arterials, including the intersection of I-70/I-75, a major focal point for intermodal traffic.

Figure 3.6 illustrates multimodal freight infrastructure and facilities located in the Region. Networks of railroads, pipelines, and roadways, along with facilities such as the Dayton International Airport and truck terminals, support the efficient movement of raw materials, manufactured items, merchandise, and/or other material goods passing through and moving within the Region.

The Region is also served by four transit agencies. The Greater Dayton Regional Transit Authority (GDRTA) serves Montgomery County residents with an extensive network of seven different types of fixed routes covering nearly 1,000 miles of directional roadways serving over 9 million passenger trips per year. Further, GDRTA's Transit Hubs, located throughout Montgomery County, connect the central city and the suburban areas with bus services at centralized locations.

Greene County is served by Greene CATS Public Transit (Greene CATS) on a demand-responsive basis, providing over 181,000 one-way passenger trips per year. Greene CATS provides flex-route service from Fairborn to Beavercreek, from Xenia to downtown Dayton, and east-west transit services within Xenia and Fairborn. The Miami County Transit System provides demand-responsive transit service for Miami County

residents, with approximately 44,000 passenger trips per year. The Warren County Transit System provides demand-responsive services in Warren County and provides 38,000 passenger trips per year.

The Region offers excellent opportunities for pedestrians and cyclists, with an extensive network of bikeways and sidewalks. The Link Bike Share has 27 station locations in Greater Downtown Dayton. Further, intermodal facilities such as Park-N-Bike and Park-N-Ride are located throughout the Region.

In early 2021, AMTRAK proposed expanding service in Ohio with five new routes. A version of the "3C" corridor (Cleveland-Columbus-Cincinnati) would stop in Dayton with 3 daily round trips. To move forward the proposal would need Federal and State support. As a result, MVRPC will continue to monitor its progress and if necessary amend as a project into the Long Range Transportation Plan.

Airports

The Miami Valley has a long aviation history since the ideas of two young bicycle shop owners became a reality with the first flight of the Wright-B Flyer in 1903. This tradition is continued today at Wright-Patterson Air Force Base, one of the premier aviation research and development centers in the world, and also at the Dayton International Airport, the United States' top 90-minute air market. In addition to the Dayton International Airport, the Region is served by four general aviation airports eligible for funding by the ODOT (see Figure 3.5). The Dayton International Airport is the focal point of the Region's air transportation network, including freight. The other airports in the Region are mainly general aviation airports that serve small private planes for personal and agricultural uses.

James M. Cox Dayton International Airport

The James M. Cox Dayton International Airport (DAY) serves as the primary commercial service airport for the MVRPC Region. The Dayton Airport is located approximately 11 miles north of downtown Dayton in northern Montgomery County on 3,870 acres. The Dayton Airport is less than a five minute drive from the I-70/I-75 interchange and has three runways: a 10,900-foot primary, a 7,000-foot parallel with operations on a parallel runway when necessary, and an 8,500-foot crosswind runway. The dual runway system allows simultaneous operations on parallel runways with landings and departures on the crosswind runway.

There were four airlines serving the airport in 2019, with American Airlines as the single largest passenger carrier, surpassing Delta after American's merger with U.S. Airways. For the 12-month period ending December 31, 2019, the airport had an average of 141 aircraft operations per day, 37% of which were air carrier, 36% air taxi, 26% general aviation, and 1% military. There are 37 aircrafts based at this airport. There are more than 51 passenger flights a day with nonstop service to 13 major domestic markets carrying

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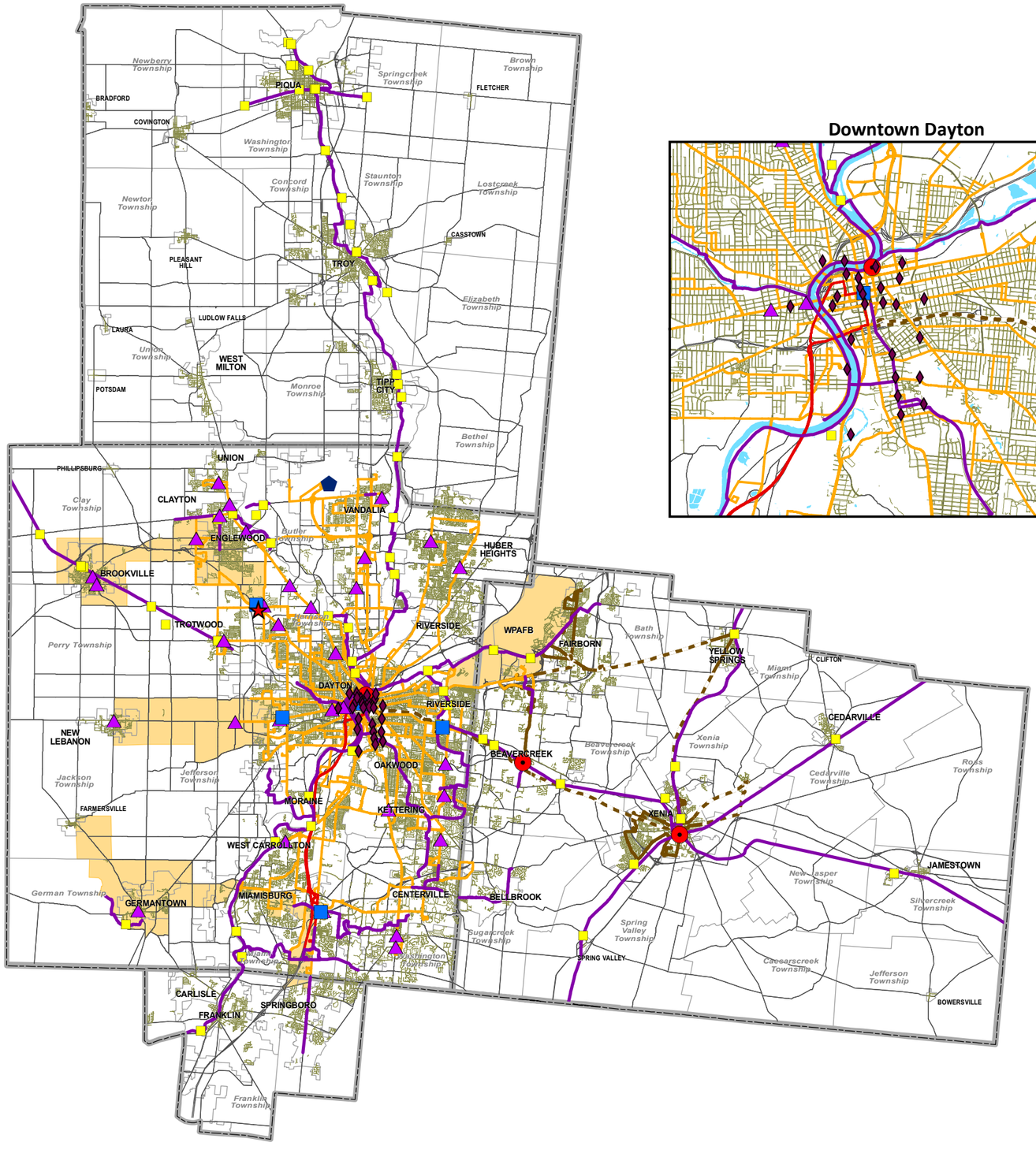
Figure 3.5
Multimodal Passenger Facilities



Downtown Dayton

- Airport
- Greyhound
- GDRTA Hub
- Park-N-Ride
- BikeShare Stations
- Regional Bikeway Hub
- Park-N-Bike
- GDRTA Connect Zone
- GDRTA Transit Route
- GDRTA Transit Express Route
- Greene CATS Flex Route
- Greene CATS "No Stops" Along Flex Route
- Regional Bikeway
- Sidewalk

Sources: GDRTA, Greene CATS, and MVRPC

May 2021

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about 900,000 passengers annually. In 2019, total passenger enplanements at the Dayton International Airport were 892,414. That is a decrease of 1.5 percent from the total passenger enplanements in 2018.

Atlanta, Chicago and Charlotte, respectively, are the three busiest domestic routes for the airport in 2019.

Overall, passenger traffic continues to decrease at the Dayton airport. Passenger traffic at the airport dropped from 148,417 in the final two months of 2018 to 146,689 during the same time period in 2019. In 2019, Dayton airport carried over 8,198 tons of air cargo, an increase of 2.0% over 2018. The majority (96.6%) of air cargo through the Dayton airport is FedEx freight.

The land surrounding the airport that once held the UPS Cargo Hub that closed in 2006 has been redeveloped and now hosts distribution hubs for Spectrum Brands, Chewy, Crocs, and other companies that started opening in 2017. These new facilities near the airport, as well as the P&G facility, have contributed to an employment boom in the area and contribute to freight traffic and airport activity.

Greene County Lewis A. Jackson Regional Airport

The Greene County Lewis A. Jackson Regional Airport (I19), situated 8 miles east of Dayton in Beavercreek Township., is undergoing numerous improvements to support increasing general aviation needs in eastern Montgomery County and Greene County. The airport underwent a significant expansion in 2005, adding runway and taxi length as well as service buildings and roads. The Greene County Regional Airport Authority owns the airport and is comprised of seven members of the community.

The 3,975 feet of paved runway at the airport was extended to 4,500 feet with FAA and local funding. For the 12-month period ending September 22, 2018, the airport had an average of 118 aircraft operations per day, 100% of which were general aviation. There are 72 aircrafts based at this airport.

Dayton-Wright Brothers Airport

The Dayton-Wright Brothers Airport (MGY) is a general aviation airport located approximately 12 miles south of the City of Dayton, on State Route 741. I-75 allows easy access to and from the airport. The Dayton-Wright Brothers Airport covers an area of 541 acres which contains one asphalt paved runway (2/20) measuring 5,000 feet.

For the 12-month period ending September 2, 2016, the airport had 89,045 aircraft operations, an average of 244 per day: 93% general aviation, 7% air taxi, and <1% military. There are 69 aircraft based at this airport.

Piqua Hartzell Field Airport

The Piqua Airport — Hartzell Field, home to 27 aircrafts, is located approximately 3 miles from downtown Piqua. The airport has a 4,000-foot runway and is the home of the Hartzell Propeller Factory Service Center. For the 12-month period ending September 23, 2018, the airport had an average of 28 aircraft operations per day: 59% transient general aviation, 39% local general aviation, and 2% air taxi.

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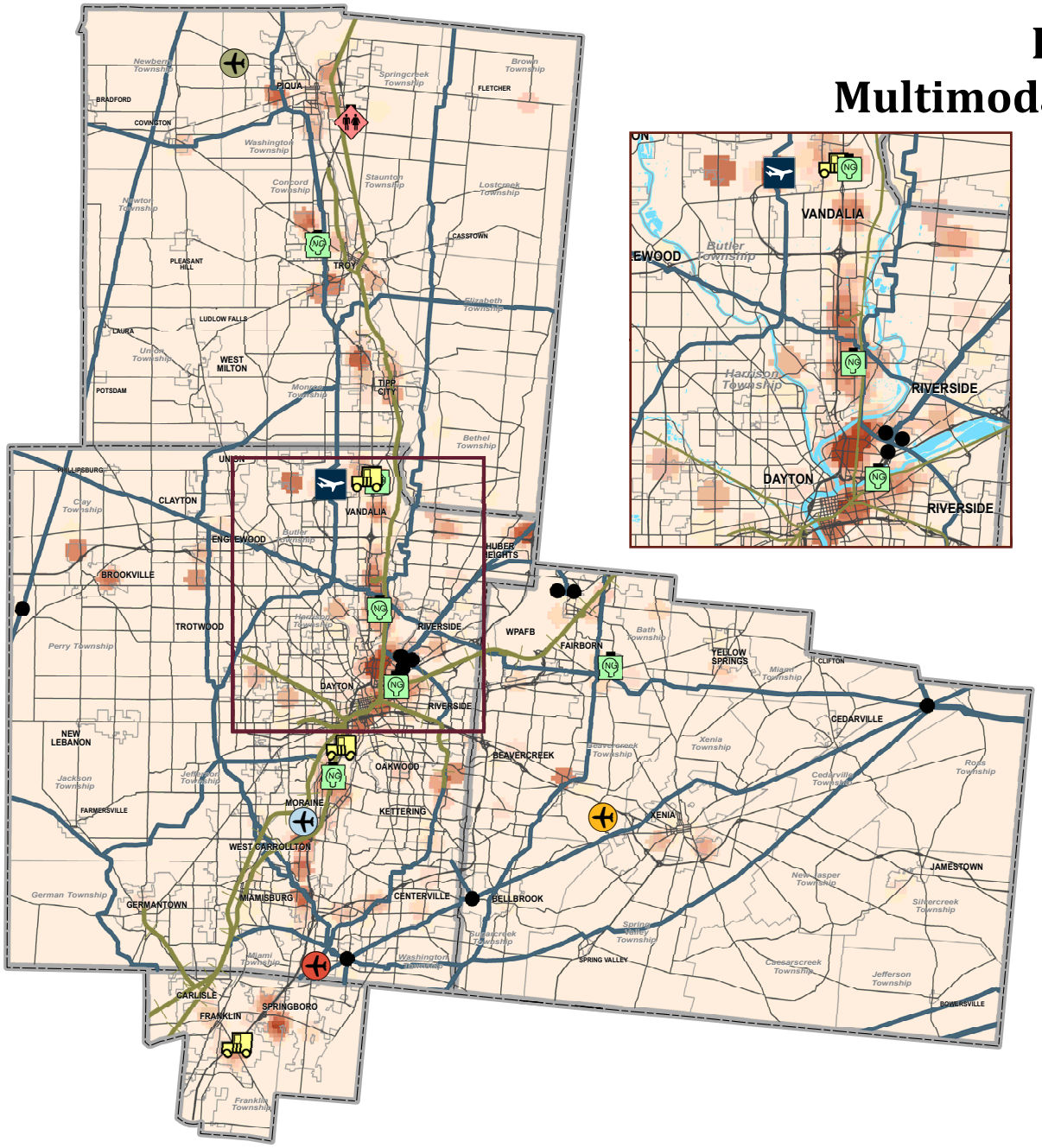
Figure 3.6
Multimodal Freight Facilities



- Dayton International Airport
- Dayton Wright Brothers Airport
- Lewis A Jackson Regional Airport
- Moraine Air Park
- Piqua Airport - Hartzell Field
- Private Travel Centers
- CNG Stations
- Rest Areas
- Pipeline Terminals
- Railways
- Pipelines
- Roads
- Concentration of Freight-Dependent Employment

Source: MVRPC

May 2021

N

0 2 4 6 8 Miles

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Moraine Air Park

The Moraine Air Park (I73) is located approximately 4 miles south of downtown Dayton. The air park is home to 126 aircrafts, including medical aircrafts owned by Miami Valley Hospital which uses the air park as a maintenance base. Facilities include a 3,500-foot runway (08/26) and a partial parallel taxiway.

For the 12-month period ending September 9, 2019, the airport had an average of 53 aircraft operations per day: 36% local general aviation, 36% transient general aviation, 27% air taxi, and <1% military.

Journey to Work Characteristics

The Region's journey-to-work characteristics were examined for Greene, Miami, Montgomery, and Warren counties using data from the 2006-2010 American Community Survey (ACS) 5-year estimates. Warren County was included as a whole for journey to work analysis purposes since detailed place "city" level data is unavailable for Franklin, Franklin Township, Carlisle, and Springboro in the Region. However, an examination of available data indicates that over 60% of Franklin, Franklin Township, Carlisle, and Springboro residents worked outside Warren County. This is consistent with the location of these municipalities at the edge of the Montgomery/Warren County border.

Work trip characteristics were examined because, although work trips make up only 10% of person trips during peak commute hours[1], that increment often makes the difference in straining the capacity of the transportation system. Figure 3.7 summarizes journey-to-work characteristics, including commuting patterns, means of transportation, and average travel time to work for Greene, Miami, Montgomery, and Warren counties.

The ACS data revealed that, although the majority of Greene, Miami, Montgomery, and Warren county residents work in the same county in which they live, Montgomery County was a major "work destination" for commuters living in the surrounding counties. Significant portions of Greene and Miami County residents were found to be traveling to Montgomery County for work. Nearly one-third of Greene County residents (31.2%), and 20.7% of Miami County residents worked in Montgomery County according to the 2006-2010 ACS data.

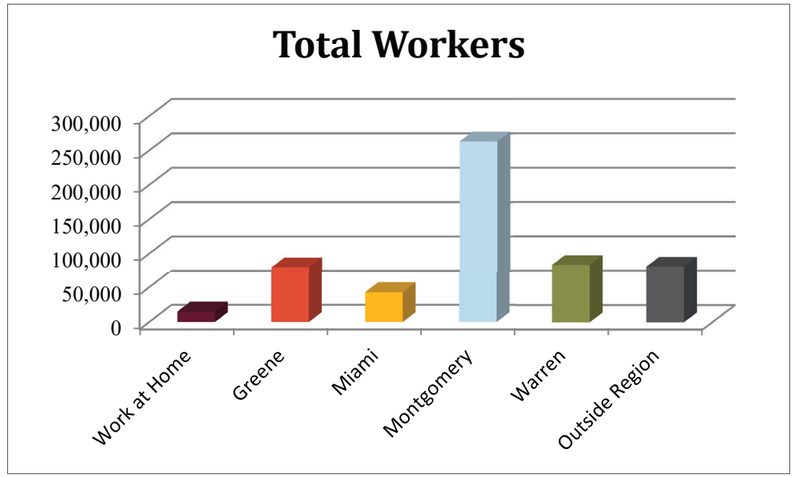
Average travel time to work was analyzed for the Region using the ACS data. The data revealed the average commute time in the Miami Valley Region to be 21.3 minutes. The average commute time was 20.8 minutes for Montgomery County workers, 19.5 minutes for Greene County workers, and 20.7 minutes for Miami County workers.

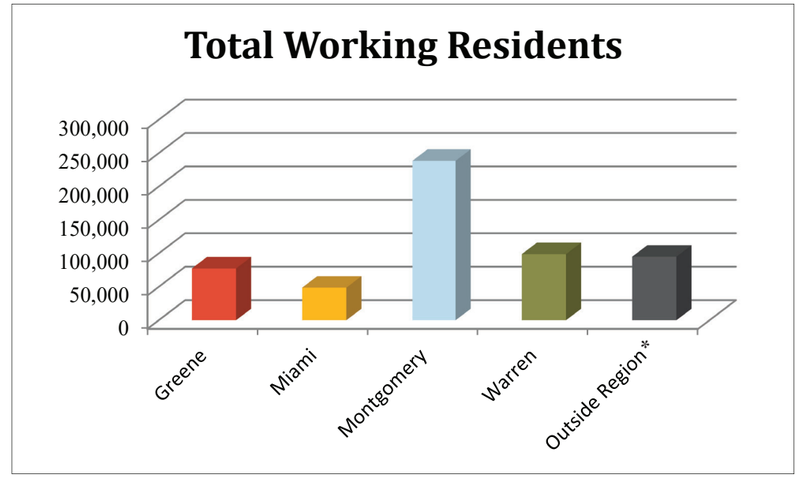
Travel trends in the Miami Valley Region follow national patterns. As is the case with the U.S., the automobile represents the preferred mode of travel. According to the 2006-2010 ACS, approximately 84% of the Region's residents drove their automobile alone to work.

[1] Federal Highway Administration (FHWA), *1995 National Personal Transportation Survey*.

MVRPC

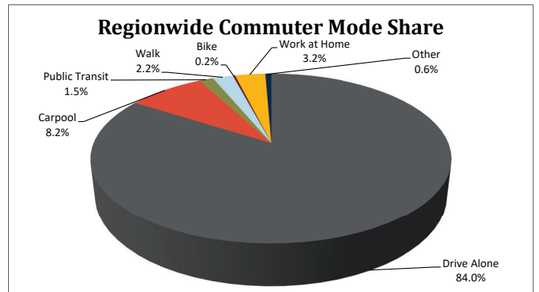
Figure 3.7 Regionwide Journey-to-Work Characteristics

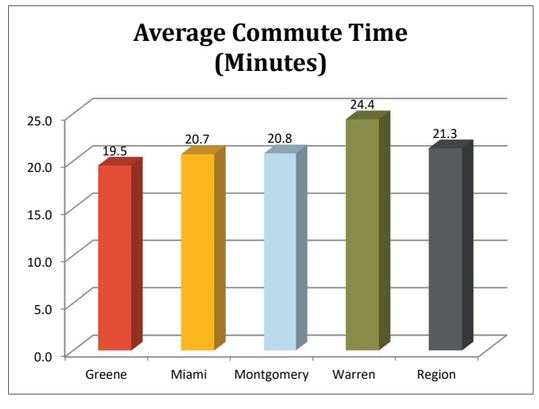




From \ To	Work at Home	Greene	Miami	Montgomery	Warren	Outside Region	Total Working Residents
Greene	2,623	41,630	426	24,126	998	7,583	**77,386**
Miami	1,354	1,332	28,494	10,109	239	7,438	**48,727**
Montgomery	6,979	23,035	4,404	181,478	5,790	22,646	**238,542**
Warren	4,017	2,008	118	12,867	36,955	42,884	**98,849**
Outside Region		11,911	9,463	34,460	39,152		**94,986** *
Total Workers	**14,973**	**79,916**	**42,905**	**263,040**	**83,134**	**80,551**	

***** Only outside residents working inside the Region are considered.





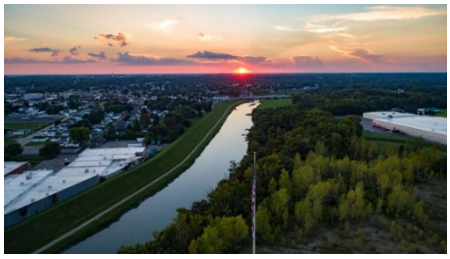
Source: American Community Survey 2006-2010

May 2021

3.3 The Miami Valley Region in the Year 2050

The Region in 2050

The Plan assumes that the development patterns of the past will remain predominant in the future. The Region will spread further away from the central city and beyond the boundaries of existing suburbs. The future of the Region will be characterized by less concentrated, low density development patterns, away from existing urban centers, and by fragmented land uses where complementary developments are not always in close proximity. However, it is expected that there will be a close relationship between transportation and land use, as future development is likely to occur along freeway corridors.



MVRPC, as a regional agency, maintains locally adopted future land use plans for jurisdictions located in the Region and constantly updates the data as jurisdictional updates become available. Although future land use plan horizon years vary among jurisdictions, they are good indicators of future growth patterns (see Figure 3.8).

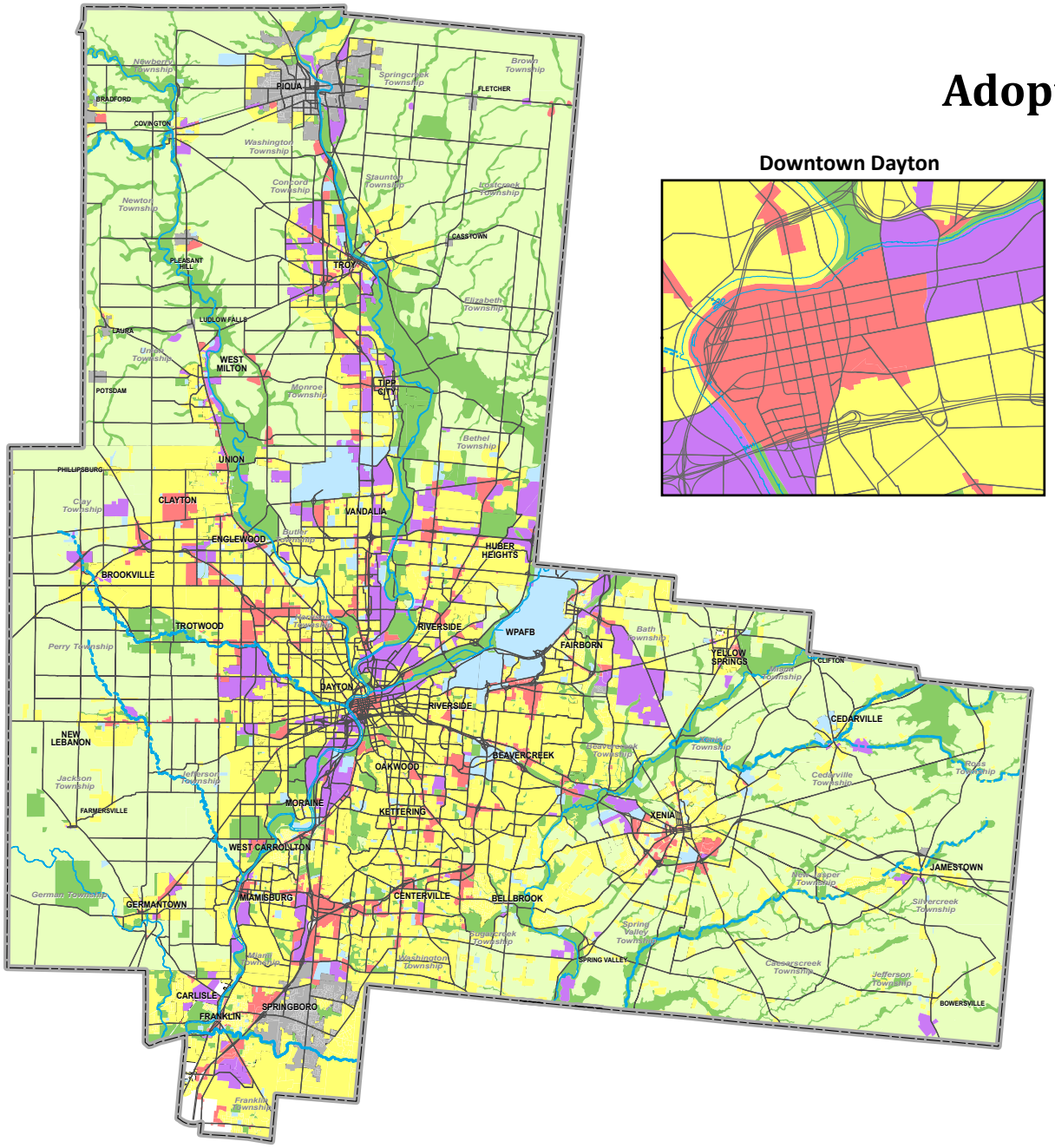
As illustrated in Figure 3.8, residential areas are to remain in the eastern part of Montgomery County, western part of Greene County, and along the I-75 corridor in Miami County. However, it is observed that additional residential developments are planned beyond what is currently developed throughout the Region. Industrial and commercial areas are planned for the western part of the City of Dayton in the vicinity of SR 49 and southern part of Montgomery County near the county line. In Greene County, commercial areas are planned in the vicinity of the I-675/US 35 interchange and industrial areas along the US 35 bypass south of the City of Xenia. In Miami County, industrial areas are planned on the outskirts of the Cities of Tipp City, Troy, and Piqua.

In addition to the expansion of residential, commercial, and industrial areas, it is expected that a certain level of infill development will occur over the next 30 years. For instance, the greater Downtown Dayton area is attracting more businesses and people; several research facilities have been planned in the vicinity of the University of Dayton, Downtown Dayton and surrounding areas are witnessing a spur in residential development, the inner suburb of Kettering is attracting office and other retail establishments, and in Moraine, the vacant former General Motors plant complex has been reinhabited by a large overseas automotive glass manufacturing company and several other smaller companies.

In summary, MVRPC anticipates that much of the growth in the Region, as illustrated in Figure 3.9, will continue to occur along the fringes of the I-675 corridor, the I-70 corridor, the I-75 corridor in Miami County, and the southern portion of I-75 in Montgomery County. Further development will occur along US 35 from the Montgomery/Greene County border to the extern edge of the City of Xenia, and along SR 49 in western Montgomery County. Northern Warren County is also projected to experience new development.

MVRPC

Figure 3.8
Adopted Land Use Plans



Downtown Dayton

- Business, Mixed
- Industrial
- Residential
- Public / Institutional
- Open Space / Recreation
- Agriculture; Rural Center
- Municipal

Sources: City and County Comprehensive Plans

Greene County
Miami County
Montgomery County
Warren County

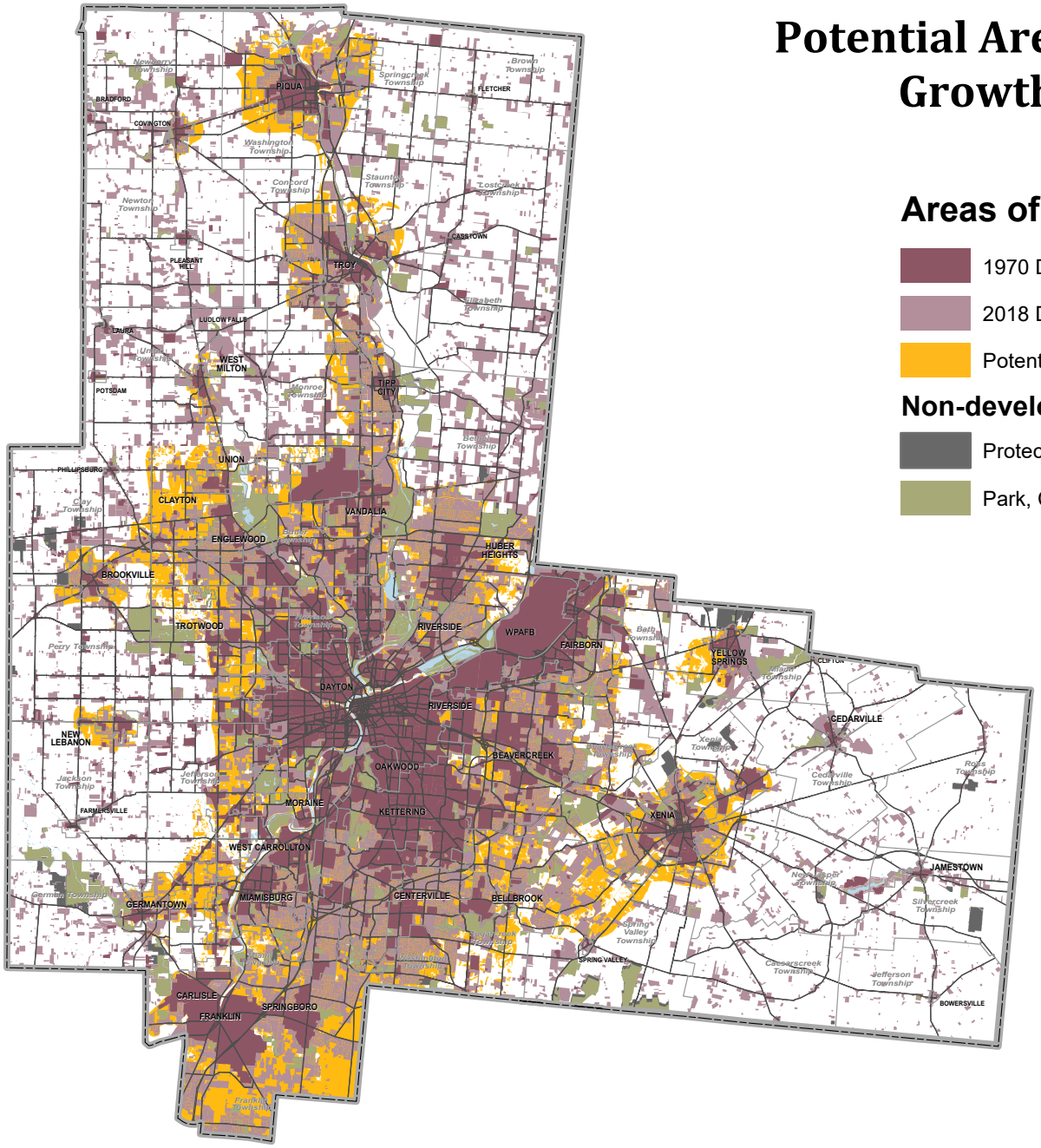
May 2021

N

0 2 4 6 8 Miles

MVRPC

Figure 3.9
Potential Areas of Concentrated Growth: 2018 - 2050



Areas of Development

- 1970 Developed Areas
- 2018 Developed Areas
- Potential Growth Areas: 2018 - 2050

Non-developable Areas

- Protected Area
- Park, Cemetery, Used Open Space

Source: MVRPC

May 2021

N

0 2 4 6 8 Miles

Population and Employment Projections

MVRPC developed 2050 population and employment projections to identify the Region's future socioeconomic characteristics and for subsequent use by the travel demand forecasting model and LRTP analyses. Projections were generated for Greene, Miami, and Montgomery counties.

For the 2021 update of the 2050 LRTP, MVRPC used the forecasts developed in 2018 based on county-level forecasts purchased from Woods & Poole, disaggregated to TAZs using 2010 base-year data, ES202 employment data by industry, and in-house databases. Each TAZ was assigned growth factors applied to the base-year population and employment totals, resulting in 2050 projections for population and employment in each of 12 forecasted industry sectors.

Overall, the population of the Region is expected to remain almost unchanged between 2010 and 2050 as shown in Table 3.3. However, Miami and Greene counties are expected to gain while Montgomery County is expected to lose population.

Table 3.3 — Population Projections: 2010 – 2050

County	Census 2010	MVRPC 2050	% Change (2010 – 2050)
Greene	161,573 (20.2%)	189,875 (23.8%)	17.52%
Miami	102,506 (12.8%)	117,295 (14.7%)	14.43%
Montgomery	535,153 (67.0%)	490,819 (61.5%)	-8.28%
Total	**799,232**	**797,989**	**-0.16%**

Source: 2010 Census/MVRPC

Figure 3.10 shows the population percentage changes from 2010 to 2050 at the TAZ level, illustrating where the population growth and decline are expected to occur. It is anticipated that there will be a continuing outward movement of population characterized by the stabilization of population losses in the older urban areas, continued growth in the newer suburbs, and some spillover of that growth into the surrounding rural areas. Thus, the central city and first ring suburbs are expected to experience the highest population declines while the outlying areas, such as southeastern Montgomery County, areas along the I-75 corridor in Miami County and areas between the City of Beavercreek and along US 35, are expected to experience the highest population gains. Areas in and around the new Austin Pike Interchange are projected to see strong growth, including areas in northern Warren County. Further, downtown Dayton is expected to moderately offset the trend of population decline in the central city when considering continued redevelopment efforts.

Table 3.4 summarizes population density by area type between 2010 and 2050. Overall, the densities for the CBD, suburban, and rural areas are anticipated to be higher in 2050 than in 2010, while urban areas are expected to exhibit lower density in 2050. Specifically, both Greene and Miami counties will have slightly higher densities in 2050 than in 2010 for both suburban and rural areas because of the outward movement of population. Conversely, Montgomery County is expected to experience a growth in density only in the

CBD area, as a result of the downtown revitalization efforts, but a decline in density in areas outside the CBD, primarily because of the County's population loss that is forecasted to occur over the next 30 years.

Table 3.4 — Population Density by Area Type: 2010 – 2050 (Persons per Acre)

Area Type	Greene		Miami		Montgomery		Total	
	2010	2050	2010	2050	2010	2050	2010	2050
CBD	-	-	-	-	4.51	5.08	4.51	5.08
Urban	5.63	5.46	7.82	7.55	5.97	5.03	6.07	5.18
Suburban	1.66	1.95	1.18	1.40	2.05	1.95	1.80	1.86
Rural	0.11	0.13	0.14	0.17	0.16	0.15	0.13	0.15

Source: MVRPC

Overall, employment in the Region is expected to grow between 2010 and 2050 by approximately 18%. The employment projections by county are summarized in Table 3.5. Both Greene and Miami counties are expected to experience substantial employment growth between 2010 and 2050 (34.52% in Greene County and 29.06% in Miami County). Montgomery County employment is expected to show a more modest growth of 10.15%.

Table 3.5 — Employment Projections: 2010 – 2050

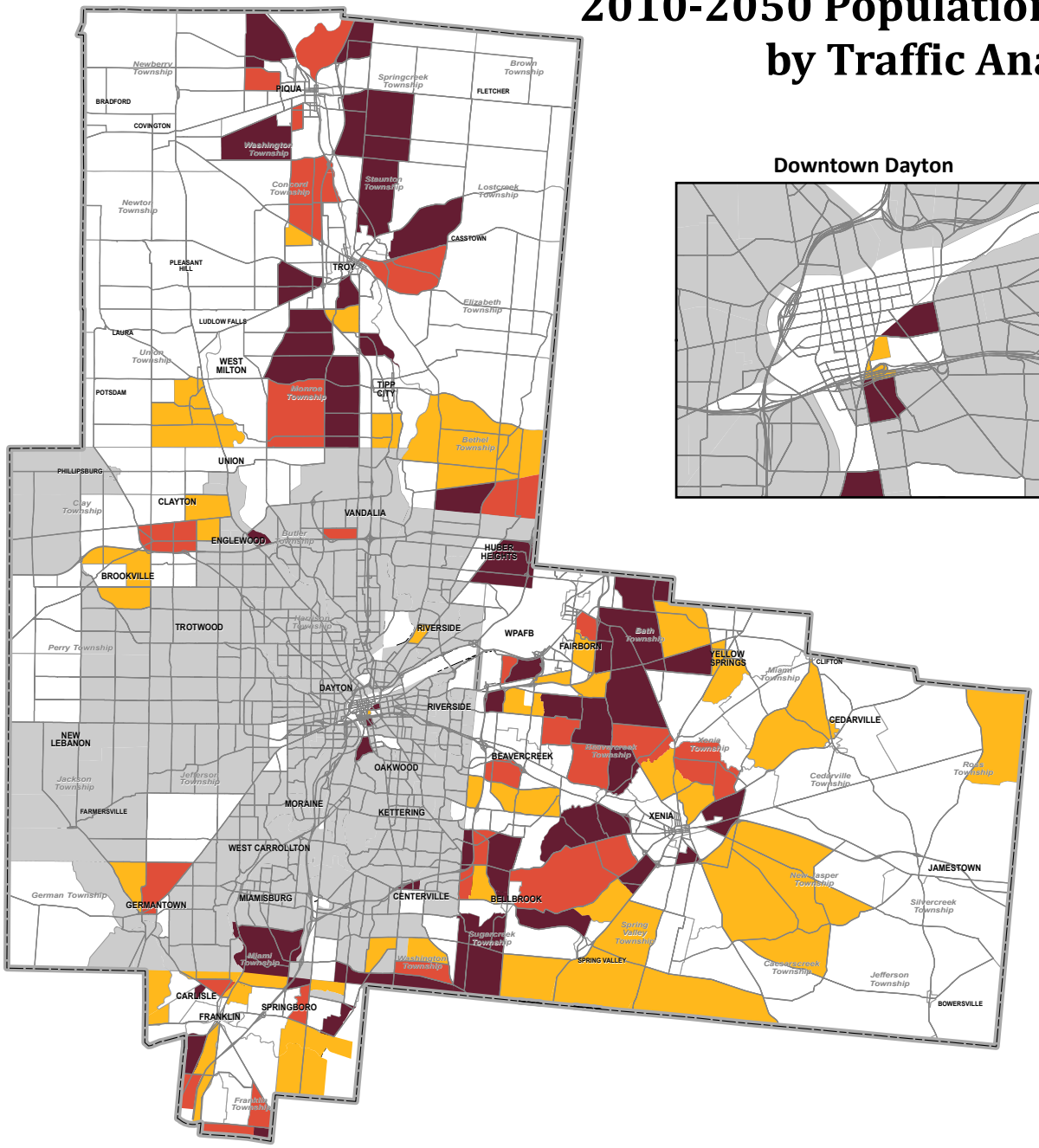
County	2010	2050	% Change (2010 – 2050)
Greene	97,406 (21.9%)	131,034 (25.0%)	34.52%
Miami	49,607 (11.1%)	64,023 (12.2%)	29.06%
Montgomery	298,018 (67.0%)	328,273 (62.7%)	10.15%
Total	**445,031**	**523,330**	**17.59%**

Source: MVRPC

In general, it is anticipated that urban, suburban, and rural areas will all experience employment growth through 2050. The bulk of employment growth is expected to continue to occur along major road corridors such as Interstate I-75, I-70, US 35, SR 4, and SR 49. The greater Downtown Dayton area is projected to experience a moderate resurgence in employment due to various revitalization efforts. The areas around Dayton International Airport and Wright-Patterson Airforce Base are expected to experience robust growth.

Employment density changes are summarized in Table 3.6. The CBD area is expected to see the highest change in employment density between 2010 and 2050, with urban and suburban areas in Greene and Miami Counties seeing the greatest percentage increase. Montgomery County urban and suburban areas are projected to see modest growth, while rural area employment density in all counties is expected to remain about the same.

Figure 3.10
2010-2050 Population Change Projection by Traffic Analysis Zone



Downtown Dayton

Population Change

- Below -5%
- -5.0% - +5.0%
- 5.1% - 25.0%
- 25.1% - 50.0%
- Over 50.0%

Source: MVRPC

May 2021

N

0 2 4 6 8 Miles

Table 3.6 — Employment Density by Area Type: 2010 – 2050 (Jobs per Acre)

Area Type	Greene		Miami		Montgomery		Total	
	2010	2050	2010	2050	2010	2050	2010	2050
CBD	-	-	-	-	33.75	39.44	33.75	39.44
Urban	6.66	8.99	3.27	4.42	2.75	3.10	2.85	3.28
Suburban	1.07	1.45	0.77	1.01	1.11	1.20	1.05	1.24
Rural	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Source: MVRPC

3.4 Travel Demand Forecasting Model

ODOT and MVRPC have worked closely together to establish and maintain a regional travel demand forecasting model since the 1960s (last updated in 2019, with a validation year of 2010). The model is a series of computerized mathematical programs using databases to rationalize the social, physical, and psychological constraints of travel patterns.

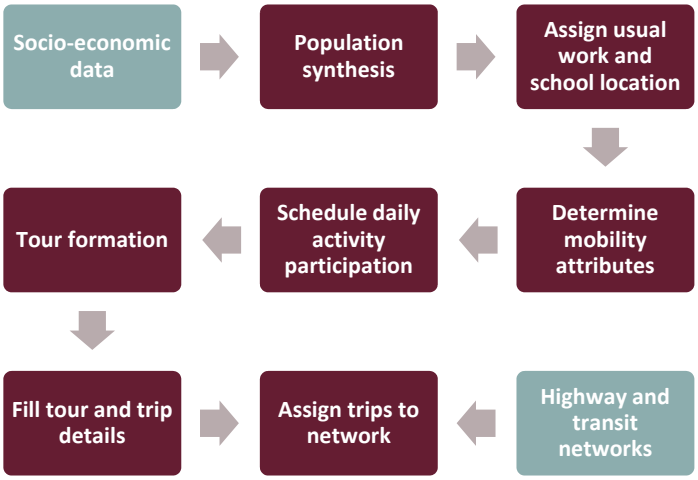
Combined OKI/MVRPC Travel Demand Model

The OKI/MVRPC Travel Demand Forecasting Model (TDFM) includes the combined planning regions under the jurisdictions of the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) and MVRPC. The combined OKI/MVRPC TDFM was originally developed as part of the North-South Transportation Initiative in 2000 and extended the OKI model design to the combined OKI/MVRPC super-region. Between 2013 and 2019, the model structure was updated again to an activity based concept from a traditional trip-based 4-step version, and for the 2021 LRTP update the horizon year was extended to 2050.

Activity Based Models (ABMs) have similarities to traditional 4-step models but rather than representing each trip individually they represent each person's activities and travel choices across the entire day. ABMs give consideration to the types of activities the individual and household need to participate in and set priorities for scheduling these activities. Because ABMs are based on behavioral theory about how people make decisions they can provide a more realistic view of travel and be used to test a wider range of policy alternatives.

Figure 3.11 shows a simplified version of the activity based model structure and how different components interact with one another. Data inputs are shown in teal and the various model steps are shown in burgundy. The results of the model are then used in model applications such as congestion management, air quality, or as needed by on-going regional transportation studies.

Figure 3.11 — Basic Model Structure



Data Inputs

Model data inputs fall into two main categories: socioeconomic variables and transportation networks. Socioeconomic variables at the TAZ level can be broadly divided between households and related variables (persons, workers, and autos per household) and employment, classified by 2-digit NAICS code. Three main sources of information were utilized to produce the 2010 base-year model. For residence-related variables, the 2010 Decennial Census was the sole source. For employment, MVRPC used a combination of ES202 data prepared by the Ohio Department of Jobs and Family Services as well as a variety of local sources and knowledge.

Households and employment are forecasted for year 2050. For intermediate years, the model has the built-in capability of interpolating between available data sets, 2010-2050. Information on the forecasting methodology and data sources is available in Section 3.3 of this chapter. Table 3.7 summarizes 2010 and 2050 Census/forecasted socioeconomic variables.

Table 3.7 — Year 2010 and 2050 Forecasted Socioeconomic Variables

Variable	Area Type				
	CBD	Urban	Suburban	Rural	Total
# of TAZs	64	209	456	125	854
Acres	873	30,770	301,234	492,832	825,709
2010 Census Population	3,938	186,871	542,603	65,820	799,232
2010 Households	2,151	77,534	223,534	24,411	327,630
2010 Employment	29,474	87,795	315,449	12,652	445,370
2050 Population	4,434	159,512	559,807	74,237	797,989
2050 Households	2,615	68,108	237,141	28,688	336,552
2050 Employment	34,434	100,925	373,715	14,256	523,330
2010 Persons per Household	1.30	2.31	2.37	2.58	2.37
2010 Workers per Household	0.51	0.99	1.12	1.32	1.10
2010 Autos per Household	0.73	1.51	1.81	2.30	1.77

Source: 2010 Census/MVRPC

The base-year transportation network is based on the existing year 2010 roadway facilities and available fixed transit routes. The network is updated on an annual basis using a combination of field surveys and orthophotos. Roadway inventory information, such as number of lanes, is then coded in the format required by the model, along with all other relevant information such as roadway capacity and speeds. A transit network, based on the 2010 GDRTA fixed transit routes (local and express), was also developed for five different time periods. The travel demand model does not have the capability of forecasting demand-responsive transit services.

Future-year highway networks are developed for the following years (2024 E+C and 2050) based on the feasibility period in the congestion management project list provided in Chapter 5 and also include completed projects between 2010 and 2020. The 2024 E+C (Existing plus Committed) network includes all projects that are currently funded in the Transportation Improvement Program (TIP). Since transit service levels are expected to remain constant throughout the planning period, all future year networks are based on current (2020) transit routes which also include Greene CATs flex routes.

Trip Summary Overview

The forecasting model and methodology first replicated existing (2010) conditions. The network was then used to forecast traffic for year 2050 based on the Existing plus Committed transportation system (2050 E+C) and for the year 2050 based on all the projects in the Congestion Management list (2050 Plan). Table 3.8 shows trips by trip purpose for year 2010 and 2050. The table shows trips increasing by approximately 11% from 2010 to 2050, the fastest growing trips are trucks and external trips at 26 and 56 percent respectively.

Table 3.8 — Typical Weekday Trip Summary

Analysis Period	Person Trips					Vehicle Trips		
	Home	Work	School	Shopping	Other	Trucks	4T-CV	External
2010	695,473	429,181	64,065	490,442	709,853	129,685	156,952	175,929
2050	739,046	471,259	65,993	520,437	753,998	163,293	169,606	274,740

Source: MVRPC

CHAPTER 4

LONG RANGE TRANSPORTATION PLANNING AND THE CONGESTION MANAGEMENT PROCESS

4.1 Overview

MVRPC has assimilated many of the state and federal goals, strategies, and programs to manage congestion through its Long Range Transportation Plan (LRTP), Transportation Improvement Program (TIP), and various regional projects, strategies, and initiatives. This chapter focuses on the evaluation of the existing regional multimodal transportation network and the overall impact of the approved 2050 LRTP Congestion Management (CM) project list on managing regional congestion. In addition, the chapter documents how congestion evaluation and management serves as input to a number of MVRPC planning processes and programs. Other relevant congestion management efforts undertaken as part of the on-going transportation planning processes at MVRPC are also addressed, including public transportation, alternative modes, and technology-based solutions such as the Freeway Management System.

Summary of Congestion Management Efforts

Introduction to Congestion

"Congestion" is generally defined from the perspective of the roadway user. The public's perception of congestion relies primarily on their own experiences when traveling on the nation's roadways. However, an engineer would describe congestion as the condition where traffic demand approaches and/or exceeds the roadway's ability to facilitate travel at normal speeds. Typically, roadway congestion manifests itself as "stop-and-go" traffic conditions.

According to the Federal Highway Administration (FHWA), roadway congestion consists of three key elements: severity, extent, and duration. The blending of these elements determines the overall effect of congestion on roadway users. Roadway congestion occurs due to a number of planned and unplanned events either in isolation or in tandem. In some cases, the clockwork nature of recurring congestion can be the sole event. For example, up to 40 percent of roadway congestion can be attributed to physical bottlenecks (i.e. sections of the roadway system that have reached their operational capacity). However, presented below, research by FHWA has identified several additional root causes for roadway congestion along with their percent contribution as a cause of national roadway congestion. Collectively, these events can cause what is known as 'non-recurring congestion':

- Traffic Incidents (25%) — Random events occurring in the travel lanes that disrupt otherwise "normal" traffic flow, such as crashes, disabled vehicles, or roadway debris;
- Weather (15%) — Environmental conditions can affect driver behavior, causing motorists to drive more slowly and/or allow for larger gaps between cars;

- Work Zones (10%) — Construction activities that alter traffic flow due to lane or shoulder restrictions, lane shifts, or temporary closures;
- Traffic Control Devices (5%) — Poorly timed or spaced signals and railroad crossings can cause intermittent disruptions in traffic flow;
- Special Events (5%) — Sudden increases in traffic demand due to planned or unplanned events, particularly in rural areas, can temporarily overburden the roadway system;
- Fluctuations in Normal Traffic Flow (Unknown) — Day-to-day changes in the traffic demand placed on the system due to random unknown causes.

Other than bottlenecks resulting from maximized roadway capacity, the above listed events take place with irregularity throughout the day. Therefore, accurately predicting travel times between two points becomes increasingly difficult as irregular congestion disrupts the transportation network over longer periods of time and larger sections of roadway, leading to frustration for commuters, commercial operators, and public officials.

4.2 Roadway Congestion in the Miami Valley Region

MVRPC used its regional travel demand model to develop scenarios consistent with the congestion management projects proposed by the 2050 Plan (see Table 5.3 in Chapter 5). Three scenarios were developed: 2010 Base conditions, 2050 Existing plus Committed (E+C), and 2050 Plan. The 2050 Plan scenario includes all projects in the Long Range Transportation Plan (LRTP), while the E+C scenario includes only projects that are funded in the SFY 2021-2024 Transportation Improvement Program (TIP). Socioeconomic data from 2010 is used on the Base scenario, while 2050 forecasted socioeconomic data is used on the 2050 E+C and Plan scenarios. Detailed information on socioeconomic data assumptions is available in Chapter 3. Performance measure statistics for the base and future year scenarios were generated for each roadway segment by using POSTCMS software developed by the Ohio Department of Transportation (ODOT). Systemwide congestion was identified by location and quantified by severity using the level of service (LOS) performance measure.

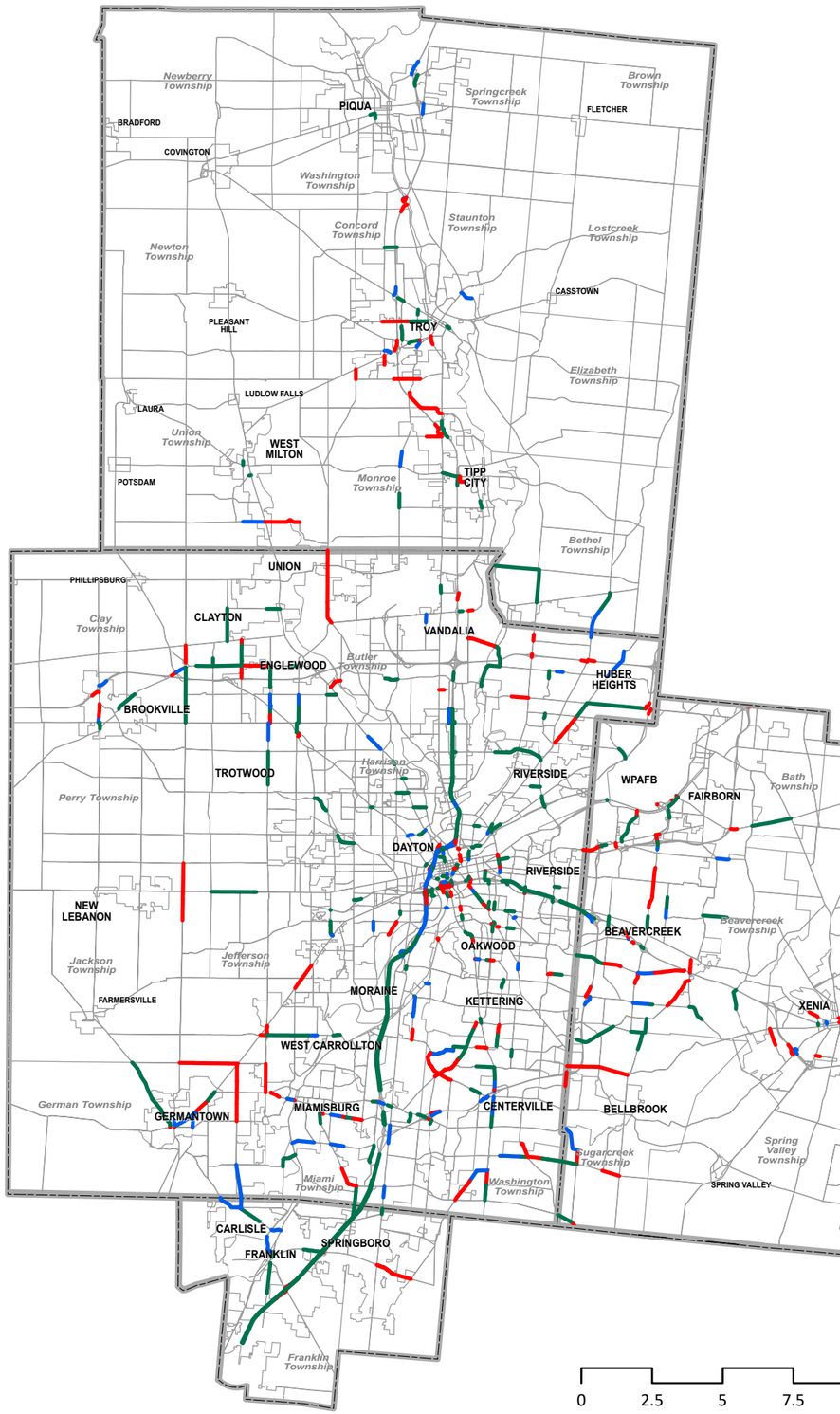
Level of Service

Level of Service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists. Volume-to-capacity (V/C) ratio is a measure of the traffic volume on a road compared to the capacity of the road. The capacity of a road depends on its physical and operational characteristics and varies by functional class. A higher V/C ratio indicates that the traffic volume of the road is nearing its capacity and is becoming congested. Similarly the ratio of average speed to free flow speed can also be used to measure congestion, with lower speed ratios indicating congested conditions.

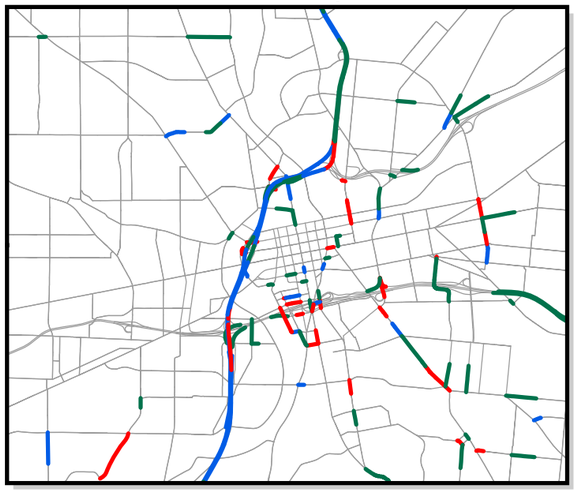
The analyses presented in this section are based on calculations by POSTCMS software and its definition of LOS by Speed and V/C ratio. LOS is broken down into six levels (A through F), with significant traveler delay and recurring congestion occurring at LOS D, E, and F. LOS was used to identify specific locations of congestion in the Base (2010), Existing plus Committed (2050 E+C) and the Long Range Transportation Plan (2050 LRTP) networks. Figures 4.1, 4.2, and 4.3 identify roads having LOS D (V/C>0.751) or worse for surface

MVRPC

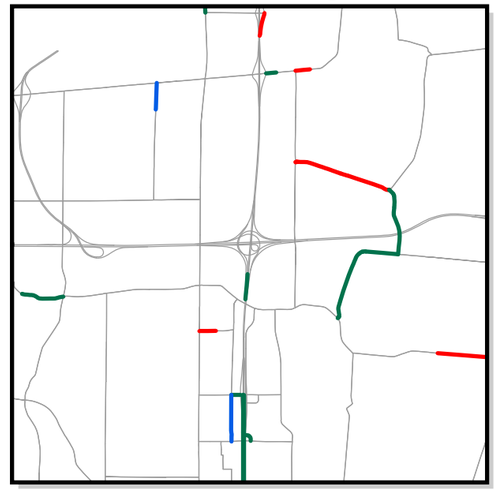
Figure 4.1
Level of Service
2010 Base



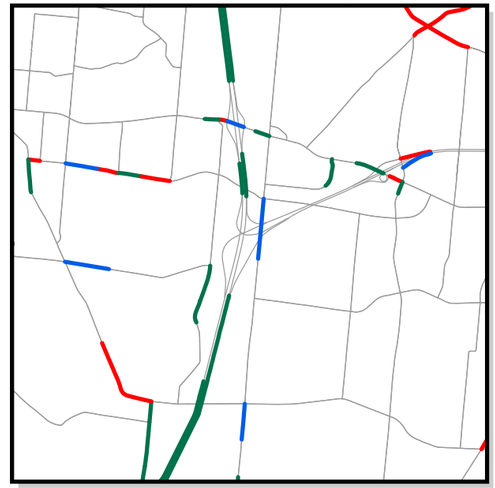
Downtown Dayton



I-70/I-75 Interchange



I-75/I-675 Interchange



Level of Service

- D
- E
- F

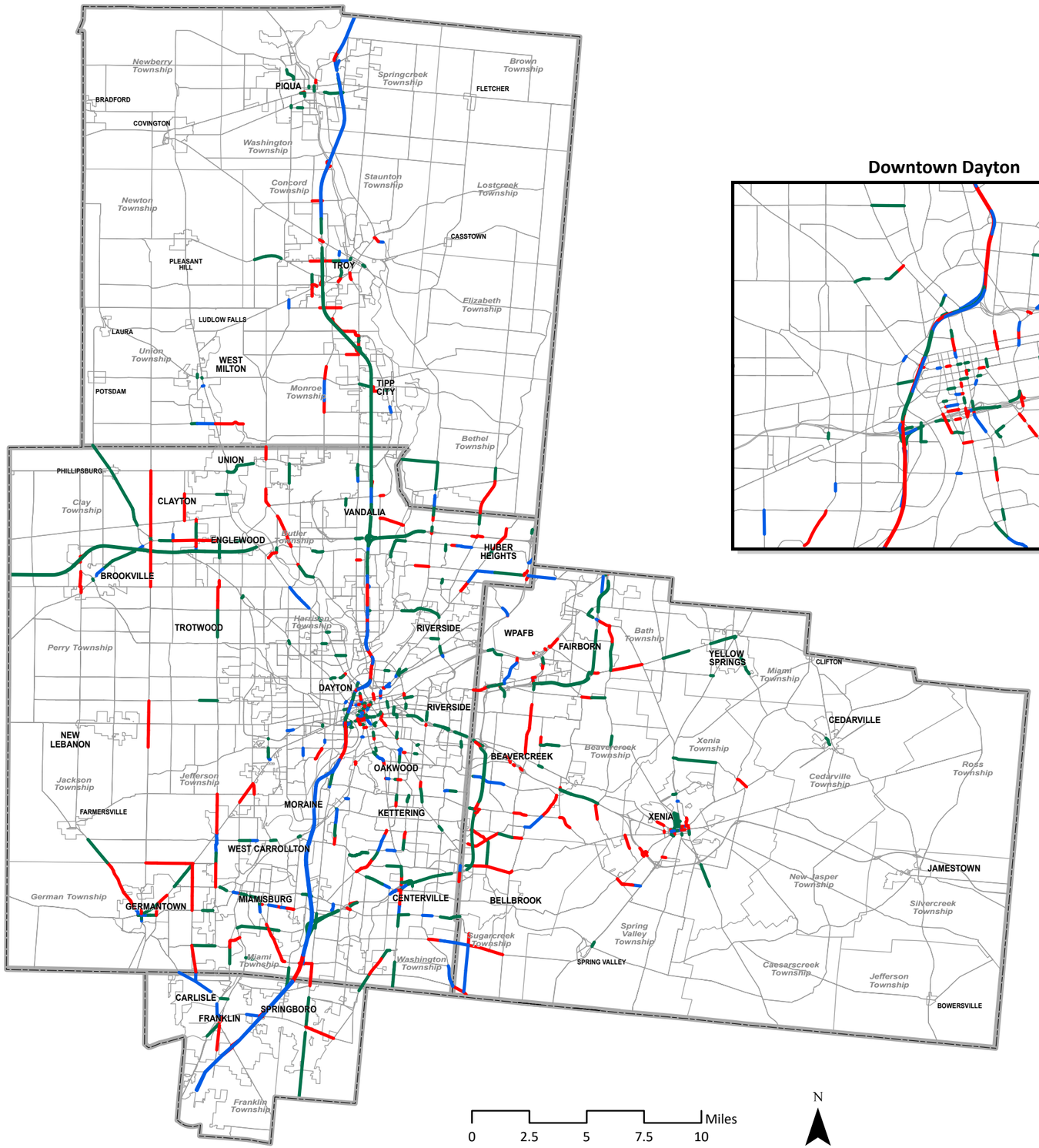
Political Boundaries

- County
- City
- Township

Source: MVRPC
May 2021

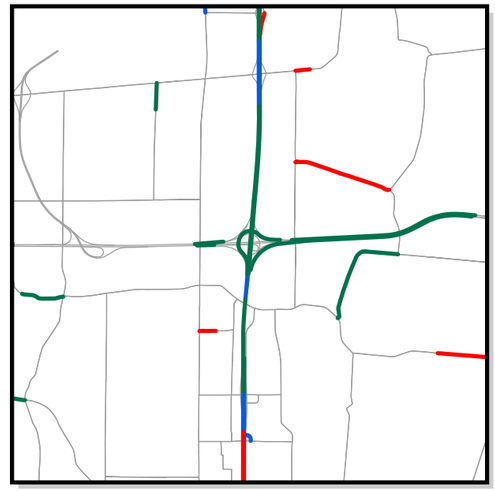
MVRPC

Figure 4.2
Level of Service
2050 Existing+Committed

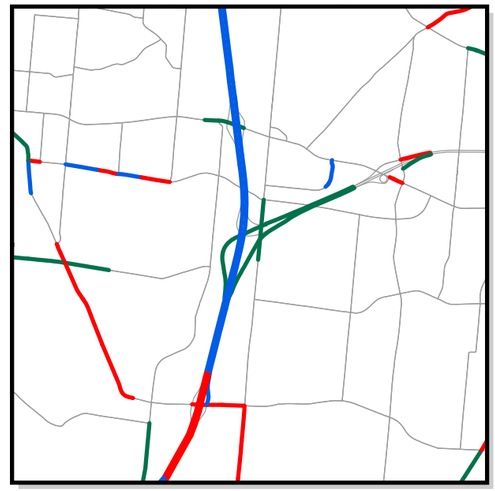


Downtown Dayton

I-70/I-75 Interchange



I-75/I-675 Interchange



Level of Service

- D
- E
- F

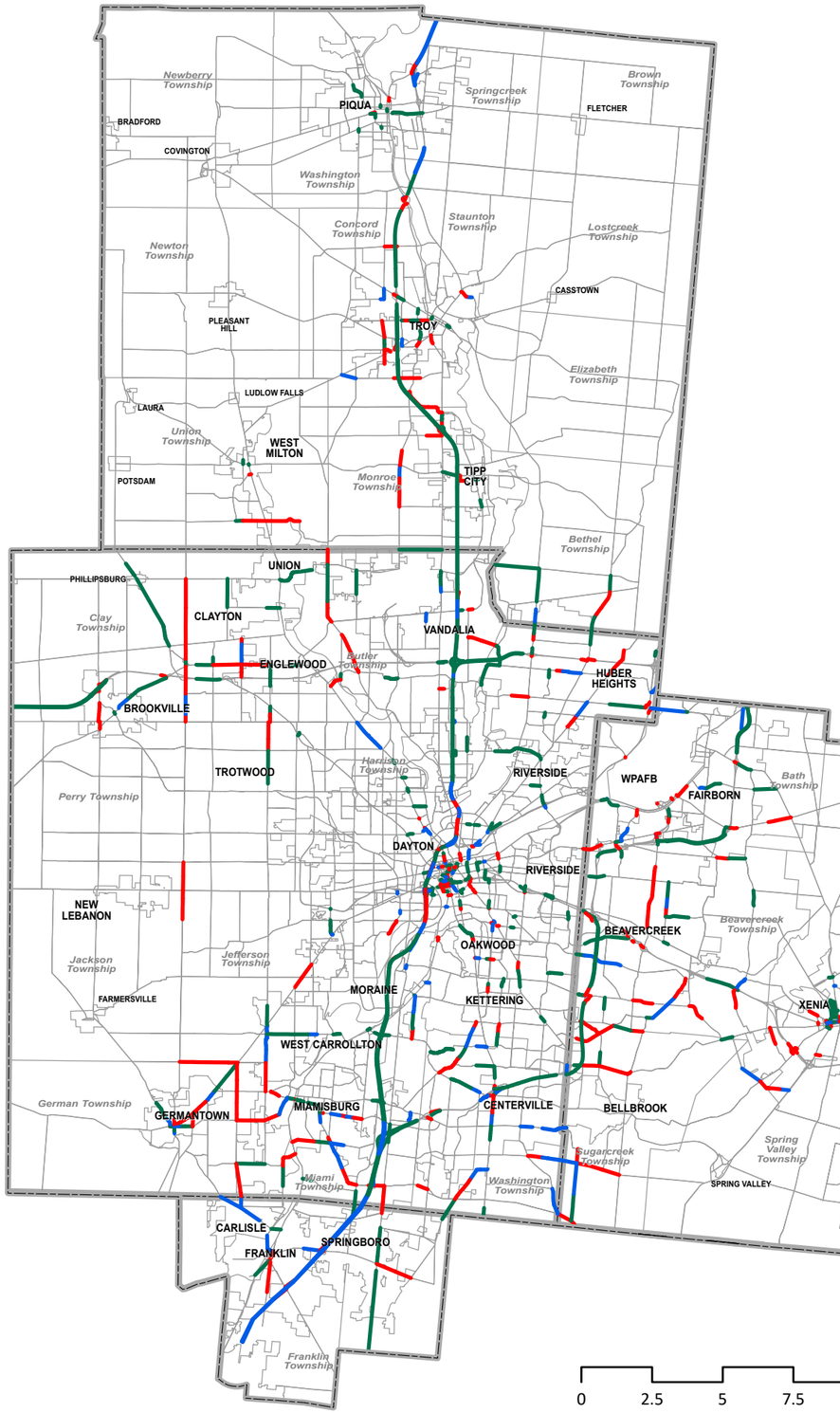
Political Boundaries

- County
- City
- Township

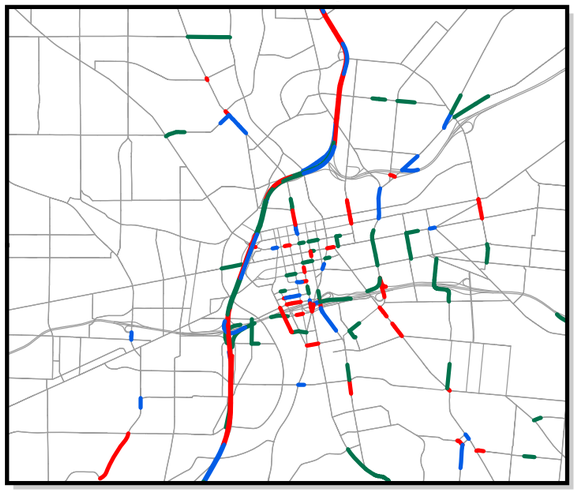
Source: MVRPC
May 2021

MVRPC

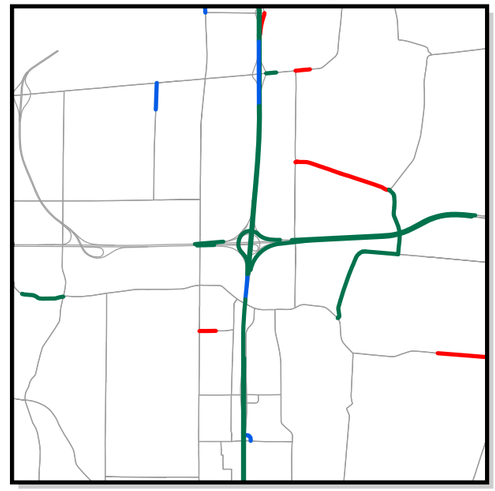
Figure 4.3
Level of Service
2050 Plan



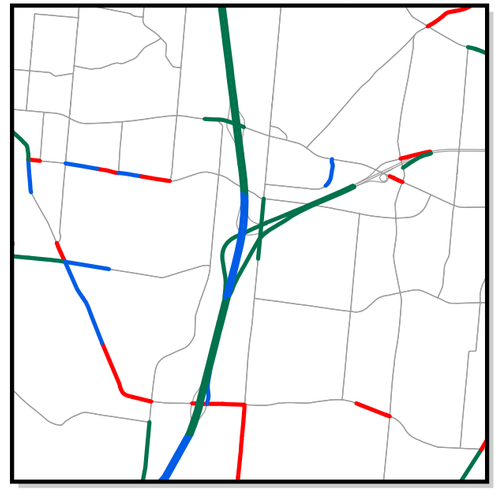
Downtown Dayton



I-70/I-75 Interchange



I-75/I-675 Interchange



Level of Service

- D
- E
- F

Political Boundaries

- County
- City
- Township

Source: MVRPC
May 2021

roads while LOS for freeways is determined by speed ratios as recommended in the 2015 Highway Capacity Manual.

2010 Base

In the Base (2010) network, roadway congestion is located mainly on I-75 and US-35 in Montgomery County, particularly in the downtown Dayton area. Roadway congestion is also present on surface roadways near local-access interchanges.

2050 E+C

Roadway congestion is increasingly present in the 2050 E+C network. The majority of freeway sections in Montgomery County will operate at LOS D or E, with significant roadway congestion along I-75 through and south of downtown Dayton, in Miami County, and near the Warren County border in Montgomery County. Congestion will also spread to I-70 and on surface roadways in rural sections of Greene County, particularly US 42 and US 68, and in parts of western and southern Montgomery County. Various projects, including interchange and freeway reconstruction, are included in the 2050 LRTP to improve the freeway performance; this is reflected in Figure 4.3 representing the 2050 Plan scenario.

2050 Plan

Under the 2050 LRTP scenario, the level of service generally improves even as demand grows with segments of the I-75 corridor improving from LOS E to D. Given the importance of freeways to the regional economy, MVRPC recommends continued monitoring and potential implementation of additional travel demand management strategies along these corridors in the medium to long-term timeframe, including connected and autonomous vehicles and other smart mobility solutions.

4.3 Congestion and Safety

The Dayton Regional Safety Initiative (DaRSI) began in SFY 2006 as a response to the emphasis placed on roadway safety by the 2005 Federal Transportation Bill known as SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users). In an effort to reduce roadway fatalities and injuries throughout the Miami Valley, the original Regional Safety Analysis (RSA) was initiated in SFY 2006. The goal of DaRSI is to generate a list of locations in need of safety countermeasures to reduce the frequency or severity of crashes.

The adoption of MAP-21 of 2012 and the subsequent FAST Act of 2015 required MPOs to coordinate with state departments of transportation on setting the following five safety performance targets for the region: number of fatalities, number of serious injuries, fatality rate, serious injury rate, and number of non-motorized injuries and fatalities. More information is available in Chapter 8.

MVRPC analyzes crash data to help improve transportation safety and inform the planning process. A number of statistical and comparative analyses are performed on the regional crash data, which is collected from the Ohio Department of Transportation (ODOT) and the Ohio Department of Public Safety (ODPS) in three-year intervals. MVRPC analyzes crash trends and generates a list of high-crash locations that identify roadways that may need further examination to determine need for improvement.

The SFY 2021 High Crash Location Analysis used the roadway crash data for the years 2017 – 2019 to rank intersections and roadway segments based on the frequency and severity of crashes. These high-crash locations were prioritized as low, medium, and high priority, and included 162 intersections and 222 segments. A few excerpts from the *2017-2019 Crash Data Report for the Miami Valley Region* are presented in the following paragraphs.

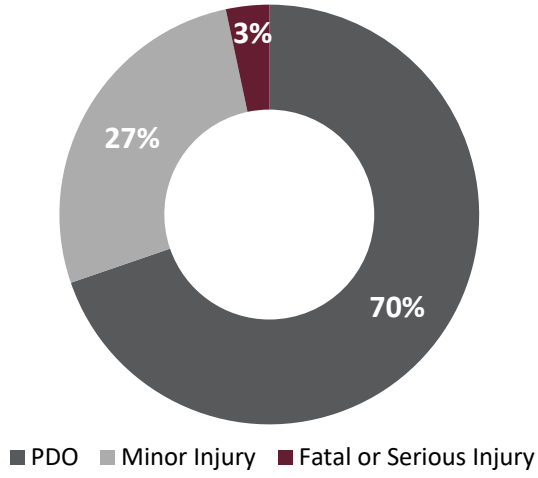
In the last 10 years, the number of crashes reported annually in the Miami Valley has increased. From 2010 to 2019, total reported crashes increased by 8%. In 2010, 19,174 crashes were reported compared to 20,721 in 2019. This increase has been noticeable despite average VMT remaining relatively constant during the same period.

Serious Crashes

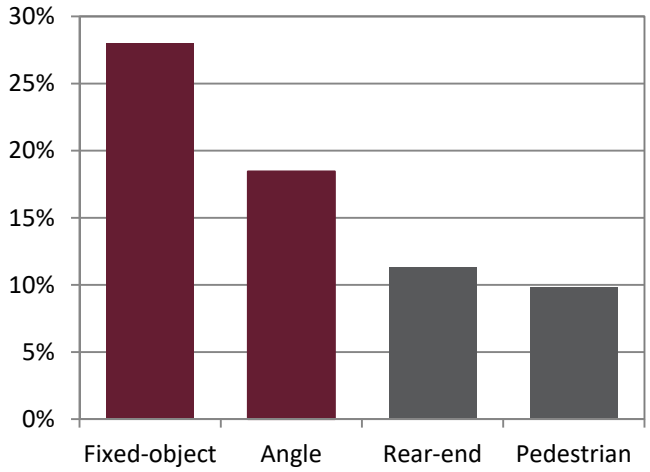
Serious crashes are those that lead to an incapacitating injury or loss of life. Although, serious crashes represented a small percent of total crashes (3%), a total of 1,134 serious injury crashes and 194 fatal crashes occurred between 2017-2019. The remaining crashes led to minor injuries or property damage only (PDO). In the last 10 years, serious injuries have decreased by 29% while fatalities have increased by 47%.

Twenty-eight percent (28%) of serious crashes were fixed object crashes, and 18% were angle crashes. These crashes varied by age group of drivers involved. Twenty-six percent (26%) of fixed-object crashes involved youth, ages 16 to 25. Similarly, twenty-four percent (24%) of angle crashes involved seniors, ages 66 and above.

Percent Total Crashes by Severity



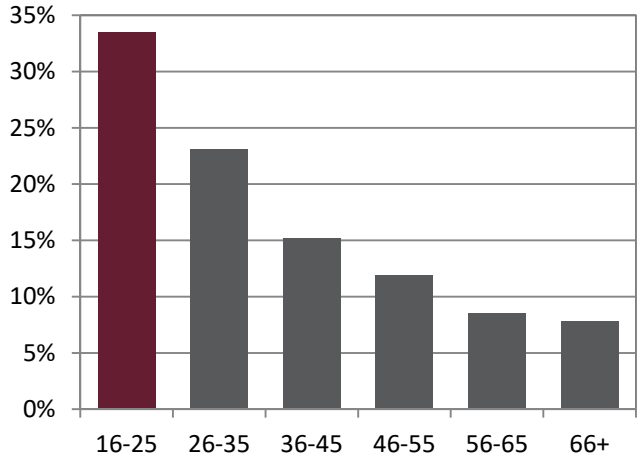
Top Crash Types Leading to Serious Crashes



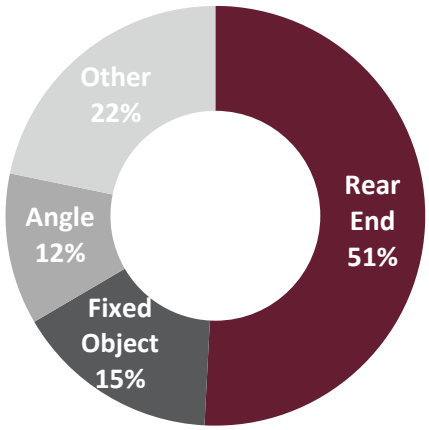
Distracted Driving

In SFY 2013, law enforcement officers were required to include detailed information on distracted driving in crash reports. A total of 3,374 distracted driving crashes were recorded from 2017 to 2019 and it is widely believed that distracted driving crashes are both under-reported and are rising. These include distractions inside the vehicle (internal), external distractions, phones, and other electronic devices. People aged 16 to 25 were most frequently reported in distracted driving. The top crash type reported with distracted driving was rear ends. Fifty-one percent (51%) of distracted driving crashes were rear ends.

Age Groups of Distracted Drivers

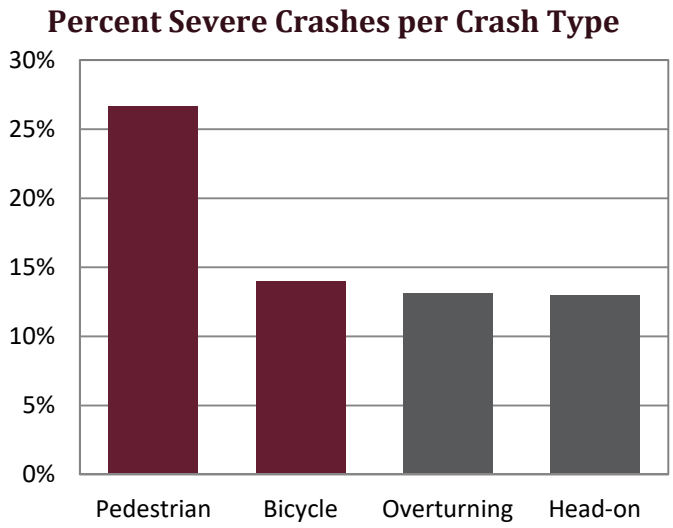


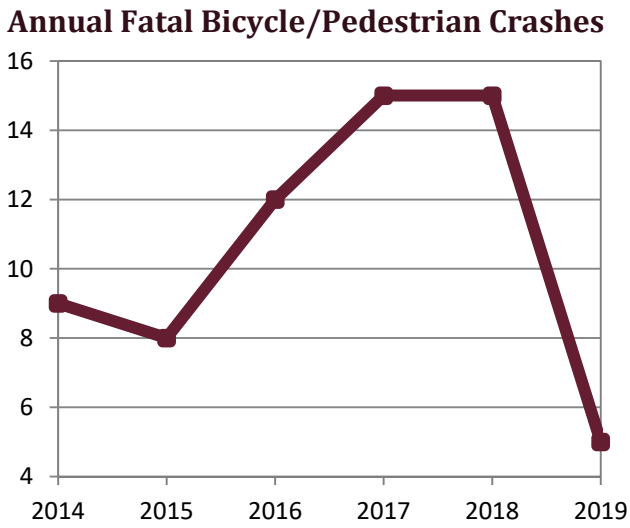
Types of Crashes Involving Distractions



Bicycle and Pedestrian Crashes

From 2017 to 2019, there were 235 bicyclist-motorist and 487 pedestrian-motorist crashes reported. While these crashes represented only a small fraction of all roadway crashes (1.5%), they were very severe. Up to twenty-seven (27%) of pedestrian crashes and fourteen percent (14%) of bicycle crashes resulted in a serious injury or fatality. The number of fatal crashes involving a bicycle or pedestrian has increased from the previous analysis period. From 2014 to 2016, 29 fatal crashes were reported; that number increased to 35 from 2017 to 2019.

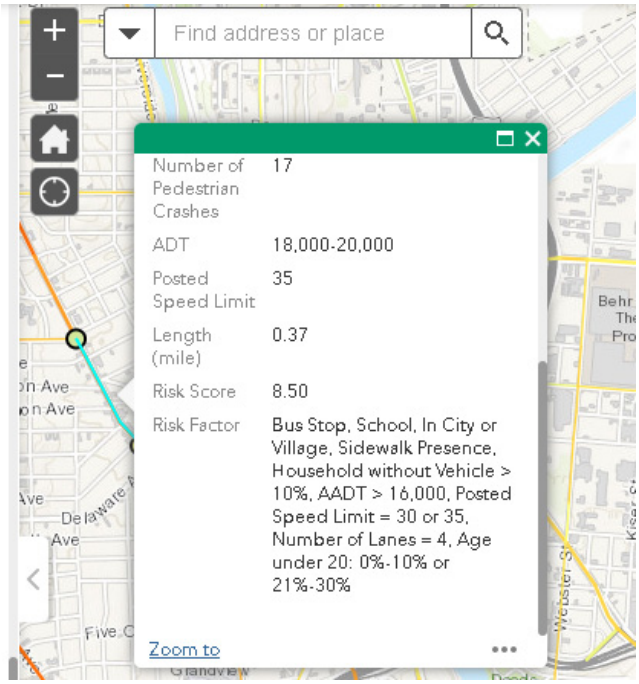




This analysis platform allows comparisons between the SFY 2021 update and past and future iterations of the Regional Safety Analysis. As future analyses are completed, MVRPC can work with our regional partners to identify locations where roadway safety continues to be a public hazard. Pre- and post-implementation data can also be compared using the analysis platform to determine if implemented safety countermeasures are achieving noticeable reductions in crash frequency and/or severity.

Pedestrian Crash Risk Assessment

Due to the high level of severity associated with pedestrian crashes, a systemic safety analysis was commissioned by ODOT to identify risk for pedestrian crashes on intersections and segments (arterials and collectors) using ODOT District 8 as a pilot and including Greene and Warren Counties in our Region. Miami and Montgomery Counties in District 7 were later added following discussions with ODOT's safety program staff.



Using a variety of data impacting pedestrian crashes, risk factors were used to identify the "priority network" — locations where conditions exist for pedestrian crashes to occur on arterial and collector facilities for both intersections and segments. Several risk factors were con sidered including roadway characteristics (e.g. speed and traffic volume) as well as area characteristics such as the presence of libraries and zero car households.

More than 400 attributes were tested for consideration and the final analysis produced 15 risk factors that were used to identify the priority network. The analysis focused on the transportation urbanized area since the majority of pedestrian crashes occur there. Locations were then plotted on a map based on an overrepresentation of risk factors — the higher the number of risk factors, the higher the risk for pedestrian crashes. A map application displaying the results can be found at: https://www.mvrpc.org/transportation/transportation-safety/pedestrian-crash-risk-assessment-study.

Safety and Congestion

There is a correlation between roadway safety and congestion, with increasing congestion levels resulting in diminished road safety. During times of recurring congestion, when the roadway is at or over capacity, there is usually an increase in crash frequency. These periods are usually during peak travel times in the morning (AM peak: 7 to 10 AM) and/or evening (PM peak: 3 to 6 PM). The chart in Figure 4.4 illustrates the percent of total crashes that occurred by hour and weekday. As indicated by the darker colors, a higher percent of crashes occurs during the peak weekday AM, midday, and PM hours than other times of the day.

Figure 4.4 — Percent of Crashes by Time and Day

Day	12A	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12P	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P	11P
Sun	0.4%	0.3%	0.4%	0.2%	0.1%	0.1%	0.1%	0.2%	0.2%	0.3%	0.4%	0.5%	0.7%	0.8%	0.7%	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%	0.4%	0.3%	0.2%
Mon	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.4%	0.9%	0.8%	0.6%	0.6%	0.7%	0.8%	0.9%	0.9%	1.3%	1.5%	1.6%	0.9%	0.6%	0.5%	0.4%	0.3%	0.2%
Tue	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.4%	1.1%	0.8%	0.6%	0.5%	0.7%	0.8%	0.8%	1.0%	1.4%	1.4%	1.7%	0.9%	0.6%	0.4%	0.4%	0.2%	0.2%
Wed	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.4%	1.0%	0.8%	0.7%	0.6%	0.7%	0.9%	0.8%	0.9%	1.3%	1.4%	1.6%	1.1%	0.6%	0.5%	0.4%	0.3%	0.2%
Thu	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.4%	1.2%	0.8%	0.6%	0.6%	0.8%	0.9%	0.9%	1.1%	1.5%	1.5%	1.7%	1.0%	0.6%	0.5%	0.4%	0.3%	0.3%
Fri	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.4%	0.8%	0.7%	0.6%	0.6%	0.8%	1.0%	1.0%	1.3%	1.5%	1.7%	1.8%	1.3%	0.8%	0.6%	0.6%	0.5%	0.4%
Sat	0.4%	0.3%	0.3%	0.2%	0.1%	0.1%	0.1%	0.2%	0.3%	0.4%	0.6%	0.7%	0.9%	0.8%	0.9%	1.0%	0.9%	0.9%	0.8%	0.7%	0.6%	0.5%	0.5%	0.4%
								14% AM Peak			27% Midday					27% PM Peak								

4.4 Smart Mobility and Connected and Automated Vehicles Scenarios

There is substantial anticipation and excitement in the area of connected/automated vehicles (CAVs) and their potential to change mobility. Given that MPOs incorporate a multi-decade planning horizon, MVRPC has begun to consider the implications of CAVs now, before their widespread implementation. To that end, MVRPC's Smart Mobility webpage highlights efforts to keep abreast of developments in these areas, and research new technologies and best practices.

State and Local Developments

DriveOhio, an initiative of the State of Ohio, was created in 2018 to highlight the State's efforts to design, test and deploy smart mobility technologies. In 2018, ODOT/DriveOhio, in partnership with the Indiana DOT and the Transportation Research Center (TRC), received a federal grant to deploy smart logistics solutions along a stretch of I-70 between Columbus, Ohio and Indianapolis, Indiana through the Miami Valley Region. The 4-year I-70 Truck Automation Corridor project, involving participation from technology providers, truck manufacturers, regional logistics councils and private freight companies, would deploy partially automated driving technology in daily "revenue service" operations on this corridor, (Photo by Virginia DOT).

Locally, the GDRTA Connect service, described in Chapter 6, is Greater Dayton RTA's effort to improve mobility in the Miami Valley through the use of smart technologies. In 2019, over 51,000 trips used the GDRTA Connect service.

The cities of Dayton, Xenia, and Springboro are also in talks with DriveOhio to pilot automated technology and infrastructure. Recent advances in mobile technologies and innovative apps have led to growth of "shared mobility" options throughout the Miami Valley.

CAV Scenario Planning and Congestion Impacts

Determining the effect automated and connected vehicles could have on traffic flow and congestion would ideally require testing the vehicles themselves in a real-world environment and widespread public acceptance. In the absence of such testing, MVRPC developed scenarios to study long-term congestion impacts of these new technologies. The analysis presented in this section is intended to start a conversation about potential benefits of CAV technology.

MVRPC's new activity-based travel demand model was used to generate and compare several congestion metrics for three different scenarios: 2050 Plan, 2050E+C with 50% CAVs, and 2050E+C with 100% CAVs. The two CAV scenarios denote 50% and 100% CAV fleet penetration respectively. All three scenarios are compared against the base 2050 Existing+Committed network as described in Section 4.2. Table 4.1 provides a summary of the various measures and their impact for each scenario. A circle symbol represents neutral or no change, "-" and "+" symbols represent negative and positive impacts, respectively. The number of "-" or "+" represent the intensity of the negative or positive impact. The model uses a "car allocation" model to predict changes on vehicle use and a capacity multiplier to increase capacity as a function of CAV fleet penetration. The highest increases in capacity are realized in the freeway system.

Table 4.1 shows that CAVs provide a significant improvement (the greater the CAVs percentage, more significant the improvement) in the percentage of peak hour VMT exceeding congestion as well as hours of congestion delay, primarily due to improvement in road capacity driven by technology enabled safety gap and harmonized speeds. Some of these gains are offset by increases in the demand for urban road use directly attributable to CAVs; the shift to CAVs is estimated to increase the vehicle person trips, percentage of single occupancy vehicle (SOV) trips, percentage of empty car trips as well as the vehicle miles traveled (VMT) due to generation of entirely new trips, and also because CAVs are likely to introduce a trip multiplier. For example, enabling trips by non-drivers to switch to a single occupancy automated vehicle. The greater the percentage of CAVs in the vehicle fleet, the worse the impact; thus, the 100% CAV scenario has double the negative impact of the 50% CAV scenario for these demand related congestion metrics.

Table 4.1 — Comparison of CAVs and 2050 Plan Scenarios against the 2050 Existing+Committed Baseline

	2050 E+C	2050 E+C (50% CAV)	2050 E+C (100% CAV)	2050 Plan	
Vehicle Person Trips 	2,675,638	2,830,858	2,897,174	2,675,541	Measure
	o	–	– –	o	Impact
Percentage SOV Person Trips 	67.3%	73.0%	77.6%	67.3%	Measure
	o	–	– –	o	Impact
Percentage Empty Trips 	0.0%	2.5%	4.7%	0.0%	Measure
	o	–	– –	o	Impact
Vehicle Miles Traveled (VMT) 	24,357,850	25,319,184	26,056,938	24,315,890	Measure
	o	–	– –	o	Impact
Lane Miles 	5,832	5,832	5,832	6,063	Measure
	o	o	o	–	Impact
Peak Hour VMT Exceeding Congestion Threshold-Percentage 	28.9%	17.6%	5.0%	26.2%	Measure
	o	+ +	+ + +	+	Impact
Hours of Congestion Delay 	30,768	18,313	8,034	27,109	Measure
	o	+ +	+ + +	+	Impact

Source: MVRPC

4.5 Public Transportation

An important tool to manage recurring and non-recurring congestion is the regional public transportation system. Public transportation provides people with mobility and access to employment, community resources, medical care, and recreational opportunities in communities across the Region. It also has the potential to significantly reduce congestion on the regional roadway network. The role of public transit in roadway congestion management is to give commuters an alternative to the automobile for local trips. The Miami Valley Region is served by four transit agencies including the Greater Dayton Regional Transit Authority (GDRTA), offering fixed route services; Greene CATS Public Transit (Greene CATS), offering deviated fixed route and demand responsive services; and Miami County Transit System (MCTS) and Warren County Transit System (WCTS) offering demand responsive services only (see Chapter 6 - Figure 6.1).

Load Factor Analysis

Transit is less attractive when passengers must stand for long periods of time, especially when transit vehicles are highly crowded. When passengers must stand, it becomes difficult for them to use their travel time productively, which eliminates a potential advantage of transit over the private automobile. Crowded vehicles also slow down transit operations, as it takes more time for passengers to get on and off[2]. Load factor is a measure of ridership compared to seating capacity of a route for a given period of time. Similar to level of service on roadways, the relative comfort that a passenger may experience while seated on a transit vehicle is given a level of service label of A through F as seen in Table 4.2. A load factor of 1.0 means that all seats are taken.

Table 4.2 — Transit Vehicle LOS and Load Factor

LOS	Load Factor	Passenger Conditions
A	0.00-0.50	No passenger needs to sit next to another
B	0.51-0.75	Some passengers may need to sit together, but not all
C	0.76-1.00	All passengers may sit together, limited seat choice
D	1.01-1.25	Some passengers will need to stand
E	1.26-1.50	Full vehicle, spacing between passengers at maximum level of tolerability
F	>1.50	Crush load, extremely intolerable

Source: TCRP Report 100: Transit Capacity and Level of Service Manual 2003

Table 4.3 shows the 10 routes with the highest load factor for each travel period.

[2]Transit Capacity and Quality of Service Manual—3rd Edition

Table 4.3 — Maximum Load Factor Level of Service

Maximum Load Factor Level of Service AM Peak (6:30 AM-9:00 AM)					
Route	**Route Name**	**Direction**	**Peak Headway**	**Load Factor AM Peak**	**LOS AM Peak**
7N	N. Main St.	Inbound	15	0.82	C
7N	N. Main St.	Outbound	15	0.80	C
9N	Greenwich Village	Inbound	25	0.75	B
14N	Trotwood	Inbound	40	0.74	B
9N	Greenwich Village	Outbound	25	0.74	B
8N	Salem Ave.-Northwest Hub	Inbound	20	0.69	B
16N	Union	Inbound	30	0.67	B
14N	Trotwood	Outbound	40	0.62	B
9S	Miami Chapel	Inbound	25	0.59	B
56	The Flyer	Northbound	10	0.58	B
Maximum Load Factor Level of Service PM Peak (3:00 PM-6:30 PM)					
Route	**Route Name**	**Direction**	**Peak Headway**	**Load Factor PM Peak**	**LOS PM Peak**
7S	Watervliet	Inbound	15	0.90	C
16S	Bigger Rd.-Kettering	Inbound	30	0.76	C
7S	Watervliet	Outbound	20	0.76	C
8S	Nicholas-Westown Hub	Inbound	20	0.76	C
14S	Centerville	Inbound	40	0.75	B
14S	Centerville	Outbound	40	0.74	B
8S	Nicholas-Westown Hub	Outbound	25	0.74	B
9S	Miami Chapel	Inbound	30	0.69	B
18S	Miamisburg	Inbound	40	0.69	B
23	South Hub-Eastown Hub	Northbound	70	0.68	B
Maximum Load Factor Level of Service Off Peak (4:00 AM-6:30 AM, 9:00 AM-3:00 PM, 6:30 PM-1:00 AM)					
Route	**Route Name**	**Direction**	**Off Peak Headway**	**Load Factor Off Peak**	**LOS Off Peak**
8S	Nicholas-Westown Hub	Inbound	65	0.99	C
18N	Troy Pk.-Huber Heights	Outbound	55	0.83	C
18N	Troy Pk.-Huber Heights	Inbound	55	0.83	C
9S	Miami Chapel	Inbound	55	0.83	C
7N	N. Main St.	Inbound	45	0.79	C
8N	Salem Ave.-Northwest Hub	Inbound	60	0.79	C
18S	Miamisburg	Inbound	55	0.73	B
8S	Nicholas-Westown Hub	Outbound	60	0.72	B
9N	Greenwich Village	Outbound	55	0.68	B
16N	Union	Inbound	90	0.68	B

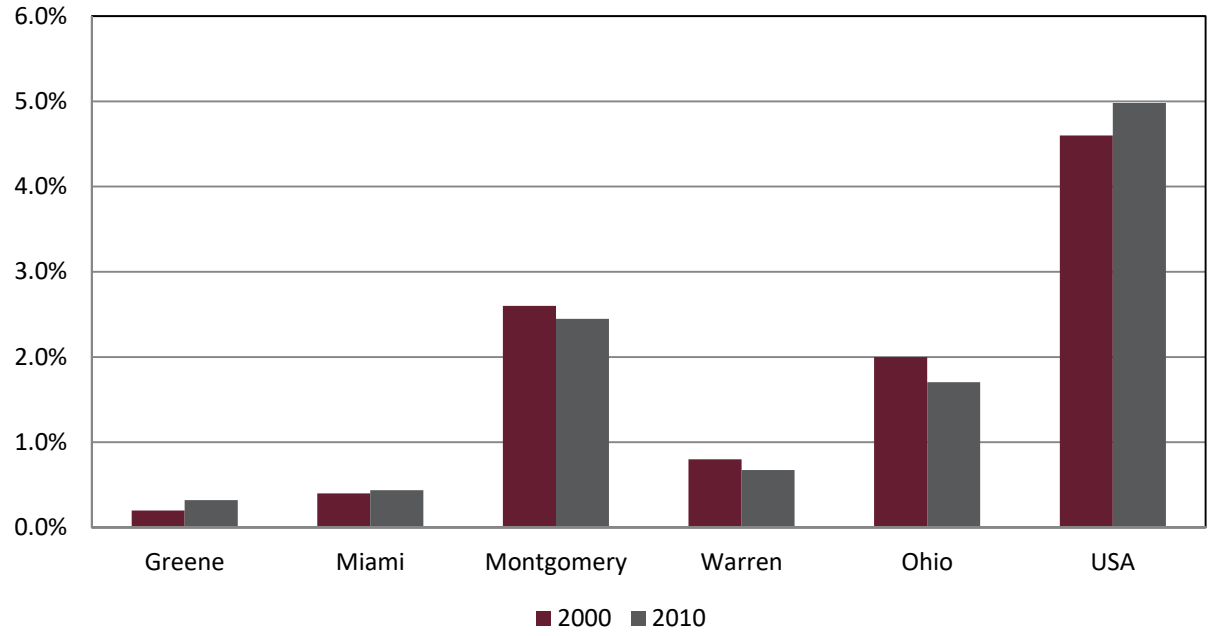
Source: GDRTA

The results of the load factor analysis indicate that all of the GDRTA routes are experiencing load factors less than 1.0, indicating high LOS and acceptable levels of passenger congestion. Riders experience comfortable conditions, available seats, and often flexible space with which to make use of their travel time. As GDRTA implements plans to attract new riders, load factors are likely to increase and headways may need to increase to maintain the current exemplary LOS for some routes.

Regional Analysis

The vast majority of the Miami Valley Region population commutes by single occupancy vehicle. Transit remains a very small portion of the regional commuting profile. Being that Montgomery County is served by the largest and only fixed-route system, its residents use public transit more than any other county in the Region. About 2.6% of Montgomery County residents use public transit on a daily basis compared to less than 1% for Greene, Miami, and Warren Counties. While all counties in the Region use public transit less than the United States average, Montgomery County residents use public transit in greater numbers than Ohio residents as a whole. Figure 4.5 displays public transit usage for all counties in the Region compared to both the Ohio and United States averages.

Figure 4.5 — Regional Public Transit Use



Source: CTTP 2000; American Community Survey 2008-2012

4.6 Regional Intelligent Transportation Systems

ITS (Intelligent Transportation Systems) continues to be at the forefront of transportation planning as MVRPC proceeds with the Region's Early Deployment Plan. The plan focuses on making the transportation system more efficient and responsive to drivers by using technological improvements instead of making major road capacity expansions. In addition to many signal coordination systems implemented throughout the years, the Freeway Management System was completed in 2012 and provides timely and accurate traveler information to motorists that can be accessed through www.ohgo.com or mobile applications.

To maintain and build upon the Region's strong ITS foundation, the Miami Valley Region ITS stakeholders initiated the development of the Miami Valley ITS Regional Architecture in 2003. Simply put, the regional architecture defines the framework on which to build the ITS system. It functionally defines what the pieces of the system are and the information that is exchanged between them. A regional architecture is required by both the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) to qualify ITS projects for federal funding after April 2005. The ITS architecture was updated in 2008 and again in 2013 and is maintained as needed by MVRPC staff.

In 2019, MVRPC updated the regional architecture again to be consistent with the recently released National Reference ITS Architecture, ARC-IT, version 8.3. To that end, the ITS list of regional stakeholders was updated and a list of relevant ITS applications and service packages for the Region were identified. Around the same time ODOT/DriveOhio commissioned a systems engineering analysis to develop a statewide framework for Connected and Automated Vehicles (CV/AV) technology deployments and incorporate it into the Statewide ITS Architecture. This framework would promote consistency and interoperability as various projects are implemented at varying scales by a wide range of stakeholders. MVRPC paused its regional architecture update program to align the schedule with the completion of the statewide ITS architecture update so that the regional architecture could be updated simultaneously with the components of the statewide CV/AV architecture as well as previously planned updates.

MVRPC continued to monitor progress on Ohio's CV/AV ITS Architecture update by attending and hosting ODOT/DriveOhio sponsored workshops. In June 2020, MVRPC staff were notified regarding completion of the State's ITS architecture update and it's availability for integration with MPO regional architectures. ODOT/DriveOhio has approved the use of the project consultant services to incorporate the State's updated ITS architecture into MVRPC's regional architecture. Upon completion of that process, MVRPC staff then plan to update MVRPC's regional architecture with previously identified non-CV/AV components.

4.7 Congestion Management Strategies

Currently, there are a number of strategies that transportation planners and engineers implement to reduce the geographic and temporal extent of roadway congestion. These countermeasures include both physical and operational roadway improvements. More often, two or more of these strategies are combined to provide for maximum congestion relief. Below is an abbreviated list of potential roadway congestion countermeasures:

- **Access Management** — These physical roadway treatments attempt to regulate the manner in which motorists access adjacent land uses by consolidating multiple driveways, providing exclusive turning lanes, and/or incorporating various median treatments including two-way left-turn lanes and non-traversable barriers.

- **Traffic Signal Timing** — Adjusting signal times for current roadway demand can be a cost effective way to increase roadway capacity and is one of the most basic roadway congestion countermeasures.

- **Freeway Management Systems** — These systems integrate a number of operational enhancements, such as cameras, dynamic message signs, and highway advisory radio, into a traffic management center which provides the motoring public with up-to-the-minute updates on current traffic conditions, allowing them to bypass areas with roadway congestion.

- **Travel Demand Management** — A transportation policy that aims to spread transportation demand amongst numerous modes, including carpooling, transit, and bikeway/pedestrian pathways, to reduce dependence on the automobile.

- **Traffic Incident Management** — A program that encourages the quick, safe, and coordinated removal of traffic incidents to restore normal traffic flow.

- **Value Pricing** — A strategy that charges travelers a user fee to access congested corridors during pre-determined periods of high demand.

- **Adding Capacity** — By increasing the carrying capacity of a roadway, the growth of congestion may be alleviated.

MVRPC's *2015 Congestion Management Process Technical Report* includes a matrix describing a toolbox of congestion countermeasures either currently implemented in the Region or their suitability for application in the Region in the future. Table 4.4 includes some congestion mitigation strategy examples from the toolbox.

As technologies emerge and our understanding of roadway congestion expands, the use of these and other strategies will have a significant effect on reducing roadway congestion, thus providing a safer and more reliable transportation network. As shown in the connected and automated vehicles (CAVs) scenario planning analysis in Section 4.4, CAVs have the potential to provide significant benefits towards congestion mitigation by increasing capacity without adding additional travel lanes.

Table 4.4 — Sample* Congestion Mitigation Strategies

Congestion Mitigation Strategy	Description	Currently Implemented in Dayton	Suitability of Application to MPO Region	Illustration / Photograph
Highway Capacity Addition Strategies				
Highway Capacity Expansion	This strategy involves increasing the capacity of congested roadways through additional general purpose travel lanes and/or upgrading interchanges on freeways. Strategies to add capacity are the most costly and least desirable strategies. They should only be considered after exhausting all feasible demand and operational management strategies.	Yes; Downtown Dayton Subcorridor Reconstruction Project; I-70/I-75 Interchange Modification, Upgrade of South Dixie Interchange from Partial to Full Interchange; Various I-70 Widening Projects.	Medium - Selected locations only.	
Alternative Transportation Mode Strategies				
Bicycle and Pedestrian Projects Including Exclusive Non-Motorized ROW and New Sidewalk Connections	Investments in these modes can increase safety and mobility in a cost-efficient manner, while providing a zero-emission alternative to motorized modes. In many cases, bicycle lanes can be added to existing roadways through restriping. Abandoned rail rights-of-way and existing parkland can be used for medium-to-long distance bicycle trails, improving safety, and reducing travel times. Increasing sidewalk connectivity encourages pedestrian traffic for short trips.	Yes; Implementation of new Regional Bikeways and Trails as well as Designated Bicycle Lanes on Facilities and Routes at the local level. Implementation of the federally-funded Safe Routes to School program provides 100 percent funding to communities to invest in pedestrian and bicycle infrastructure surrounding elementary schools. A Bikeshare program implemented in Dayton in spring of 2015.	High.	
Travel Demand Management Strategies				
Transportation demand management (TDM) strategies are used to reduce travel during the peak, commute period. They are also used to help agencies meet air quality conformity standards, and are intended to provide ways to provide congestion relief/mobility improvements without high cost infrastructure projects.				
Alternative Work Hours	There are three main variations: staggered hours, flex-time, and compressed work weeks.	Yes; Alternative Work Hours are becoming more common. WPAFB, the Region's largest employer, allows a variety of work schedules.	Medium to High.	
Intelligent Transportation Systems (ITS) Strategies				
The strategies in ITS use new and emerging technologies to mitigate congestion while improving safety and environmental impacts. Typically, these systems are made up of many components, including traffic sensors, electronic signs, cameras, controls, and communication technologies.				
Dynamic Messaging	Dynamic Messaging uses changeable message signs to warn motorists of downstream queues; it provides travel time estimates, alternate route information, and information on special events, weather, or accidents.	The Dayton/Springfield Freeway Management System (http://www.mvrpc.org/transportation/long-range/its), combines technological and operational solutions to manage congestion growth. It also enhances existing incident and traffic management activities on the regional freeway network and provide timely and accurate traveler information to motorists. In 2013, ODOT launched a new website (www.ohgo.com) designed to provide motorists with real-time travel information using ITS technology on Ohio's roadways. In 2015, GDRTA implemented a mobile app project which allows app users to select their route to see real-time tracking data on all running buses.	High.	
Advanced Traveler Information Systems (ATIS)	ATIS technology provides access to an extensive amount of data to travelers, such as real-time speed estimates and information on alternate route options.		High.	
Transportation System Management Strategies				
Traffic Signal Coordination	Signals can be pre-timed and isolated, pre-timed and synchronized, actuated by events, set to adopt one of several pre-defined phasing plans or set to calculate an optimal phasing plan based on current conditions.	Yes. There are numerous examples throughout the Region. This strategy is particularly well-suited for built-up urban areas where capacity expansion is difficult or unfeasible.	High.	
Other Miscellaneous Strategies				
Traffic Incident Management	This strategy addresses primarily non-recurring congestion, typically includes video monitoring and dispatch systems, and may also include roving service patrol vehicles.	Yes; ODOT, in collaboration, with State Farm, launched the State Farm Safety Patrol Program that provides for freeway incidence response vehicles to improve traffic flow and reduce traffic congestion due to stalled vehicles as well as offers roadway assistance to mortorists in need.	High.	

* To view the complete congestion mitigation matrix, see Table 5.1 in MVRPC's *2015 Congestion Management Process Technical Report.* (http://www.mvrpc.org/transportation/long-range-planning-lrtp/congestion-management-process)

CHAPTER 5

CONGESTION MANAGEMENT STRATEGIES–HIGHWAY

5.1 Overview

Following the Long Range Transportation Plan kick-off meeting in August 2020, MVRPC worked with stakeholders in the Region to develop Congestion Management (CM) highway projects for the period between SFY 2021 and 2050, including all roadway capacity expansion projects and other projects not covered under the operations and maintenance program.

In order to develop the final congestion management project list for the 2050 LRTP update, MVRPC hosted a project sponsor webinar, followed by virtual public participation meetings. The process continued by identifying future revenue capacity and conducting a systematic evaluation of projects.

As a result, the 2050 LRTP includes 212 projects with a total cost of $2,326.89 million. The congestion management list is fiscally constrained, with projected revenue of $2,959.46 million. The remainder revenue, $4,240.00 million, is reserved for operations and maintenance/reconstruction projects. As required by the FAST Act, both costs and revenues are expressed in year of expenditure dollars.

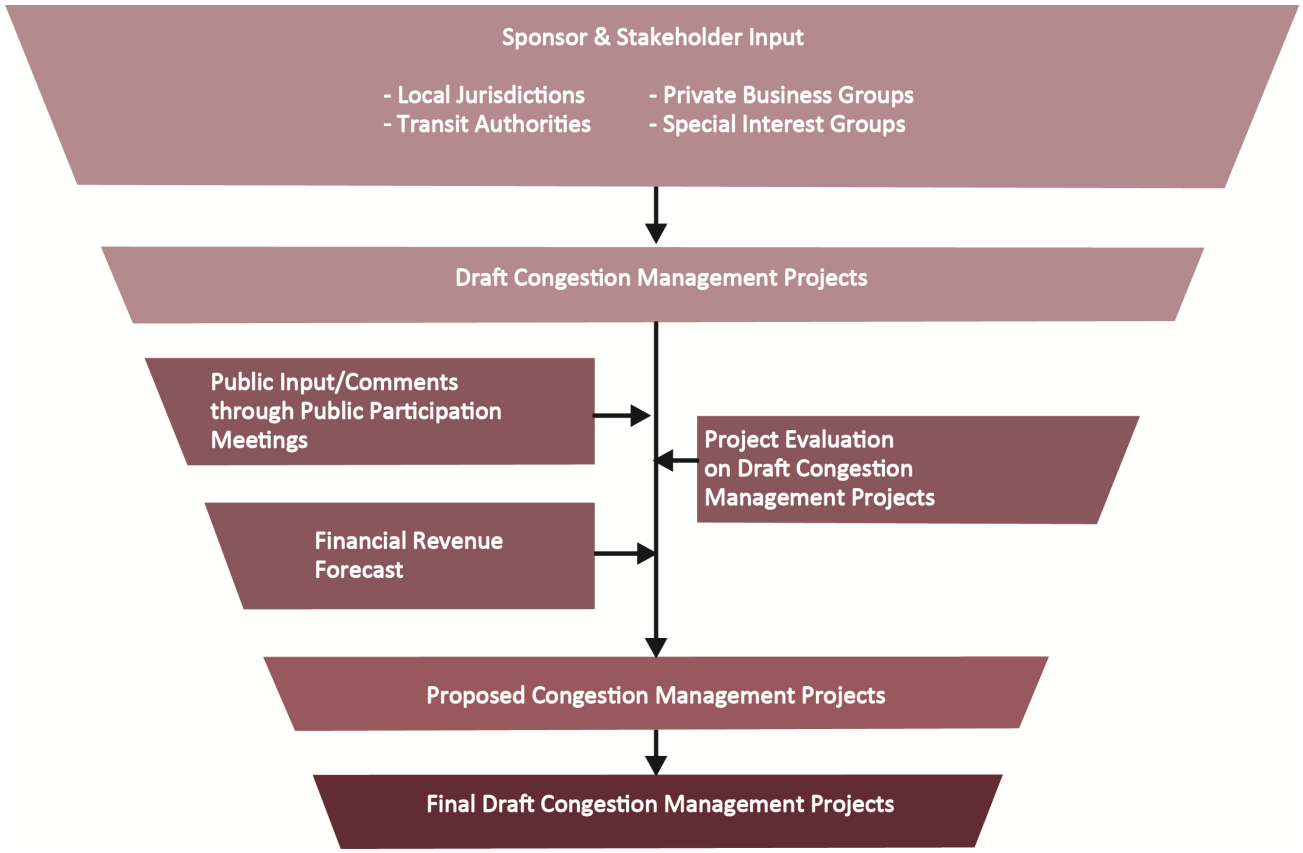
5.2 Process Overview

MVRPC developed the final CM projects following several interactive steps in conjunction with local stakeholders in the Region. Representatives of all stakeholders in the Region, from local jurisdictions to the general public, were also involved in every step of the process.

MVRPC first sought sponsor and stakeholder input through virtual meetings and a stakeholder survey. MVRPC staff then compiled the draft, not-fiscally-constrained, project list and modified it as necessary to make the list of projects consistent. MVRPC hosted virtual public participation meetings to present the draft CM list and to solicit comments from the general public. After the meetings, applicable comments received from the public were forwarded to the appropriate project sponsor and, if necessary, the projects were modified. Next, the financial analysis was conducted to determine the available 30-year revenue. Staff then completed the project evaluation process and developed a fiscally constrained proposed project list. Finally, the proposed project list was presented at the MVRPC committee meetings and adopted by the Board of Directors in December 2020, which then directed staff to begin the analyses pertaining to the Plan update.

The following sections of this chapter provide in-depth information on each step of the congestion management project development process.

Figure 5.1 — Congestion Management Projects Development Process Overview



5.3 Sponsor and Stakeholder Input

MVRPC invited both governmental and non-governmental organizations to submit projects to the 2050 LRTP by sending an invitation email. In addition, web links to the Project Profile and Evaluation Forms, along with pertinent background information materials on the state of the transportation system, were emailed prior to the meetings and made available on the Plan website (plan2050.mvrpc.org).

Project sponsors were encouraged to submit forms electronically, using user friendly point and click forms. The background information materials attached with the invitation email and available on the Plan webpage included:

- List and maps of Congestion Management Projects in the current LRTP;
- Project Evaluation System, including project profile and evaluation forms, criteria definitions, and maps;
- Project review spreadsheet; and
- Tips for project submission.

A seminar for jurisdictions on how to submit LRTP projects, was held following the August 2020 Technical Advisory Committee (TAC) meeting via zoom.

Pursuant to its public participation policy and the consultation requirements in the FAST Act, MVRPC invited stakeholders, including project sponsors, on its public participation contact list to participate in an online survey to gauge the Region's satisfaction with the availability and condition of the existing transportation infrastructure and to set priorities for the future. At the end of the survey, respondents were also given the opportunity to submit comments. The results can be seen in the Public Participation Summary document.

MVRPC staff electronically communicated with all jurisdictions and project sponsors regarding project submission requirements and deadlines, and also provided them with a review spreadsheet that could be used to update the status of CM projects included in the previous LRTP to identify those that have been completed or are under construction, to update the current status of remaining projects (including deletion of projects), and to identify new projects. The Project Profile Form and the Project Evaluation Form were submitted by the project sponsors electronically.

MVRPC received a total of 212 CM projects. Once all the projects were submitted, the staff compiled the projects and worked with the appropriate project sponsor to fine-tune the projects in terms of scope, feasibility, and cost to develop a draft, not-fiscally-constrained, CM project list. Further, the draft project list was sent to project sponsors for their review prior to the public participation meetings in October 2020.

In general, project cost was estimated by the project sponsor and included in the Project Profile Form. However, other sources such as the TIP and relevant transportation studies were also used when necessary. Due to recent trends in construction related inflation, project sponsors were encouraged to re-estimate the cost of all projects being submitted to the LRTP process using up-to-date assumptions.

5.4 Public Participation

Two public participation meetings were held via zoom on October 20 and 22, 2020, to present the draft CM projects and to solicit comments from the general public and other interested parties. Comments received regarding the draft CM projects were reviewed by MVRPC staff, forwarded to the appropriate project sponsor and, if necessary, projects were modified accordingly. All comments were also presented to the TAC and Board of Directors prior to the adoption of the draft congestion management project list. Please refer to Chapter 11 – Public Participation and Consultation for more information regarding the October public participation meetings.

5.5 Project Evaluation

MVRPC developed the Project Evaluation System (PES) for the 2004 LRTP in order to advance transportation projects that are consistent with regional transportation priorities. The PES was based on the common themes and transportation values identified by the 2003 visioning process TransAction 2030 and reflected under the Plan goals and objectives described in Chapter 1.

In 2006, MVRPC undertook a major review of the project evaluation system to ensure that the process is a more collaborative, transparent, and interactive way to work with member jurisdictions. As a result, some

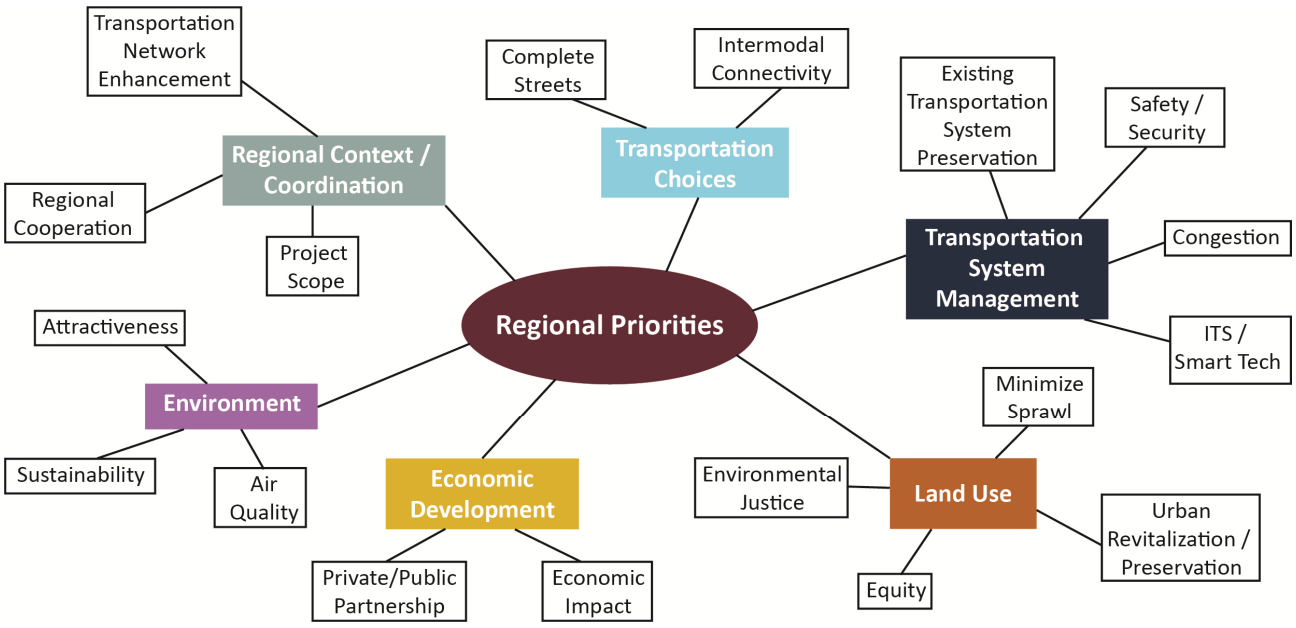
criteria were modified, additional explanation and examples were provided, and a complete set of maps and data were made available to project sponsors to aid in the self-scoring process.

In 2019, MVRPC staff worked with a PES Update Committee, comprising 15 TAC or Board members representing MPO member agencies and communities, to undertake another major review of the PES. Following an analysis of the projects funded over the previous decade, the motivation for the 2019 update was to better align the criteria with the type of projects that are currently being funded, and to incorporate equity criteria and a performance management approach for project scoring and selection.

The PES is now available on the MVRPC website along with all relevant information and the MVRPC staff works with participants to ensure a full understanding of the process, including hosting a seminar for project sponsors. PES maps and criteria are updated as needed to ensure that they are based on the most recent information.

Figure 5.2 illustrates the conceptual design structure of MVRPC's PES.

Figure 5.2 — Project Evaluation System Design Concept



The PES is both exhaustive and equitable, while also being easy to understand. Although some of the criteria under the different categories may appear to overlap, the attributes that they measure for each project remain distinct and unique. Specifically, the PES for highway projects measures 20 indicators, with a maximum total of 70 points grouped by 6 themes. These themes are: Regional Context/Coordination; Transportation Choices; Transportation System Management; Land Use; Economic Development; and Environment. Based on the PES, the Project Evaluation Form was updated so that a project sponsor could complete the project evaluation and attach it to the Project Profile Form at the time of project submission.

Once all Project Evaluation Forms were received, MVRPC staff reviewed them for consistency, accuracy, and completeness of data for each individual project. A cross-examination of all projects was also conducted to ensure that the evaluation remained equitable. Other factors such as existing traffic counts, future projected traffic volumes, future land use plans, and corridor completion were incorporated into the evaluation process to determine the proposed fiscally-constrained project list.

5.6 Congestion Management Projects

Based on public input, future revenue projections by timeframe, and the project evaluation process, MVRPC proposed 212 projects with a total cost of $2,326.89 million for the 2050 LRTP. All of the projects submitted to the LRTP process are included in the final CM list. However, due to additional requirements regarding the LRTP financial plan, some projects were moved to later years of the Plan where financial capacity was expected to be available. Decisions about what projects to cut or move to a later period were made based on the PES score, public input, and consultation with the project sponsor. MVRPC presented the proposed project list to its committees and the Board of Directors adopted it on December 3, 2020, making the proposed project list the final draft list. Minor changes to the list occurred between December 3, 2020, and the plan adoption on May 6, 2021 and the list was again presented to the public in April 2021. The final 2050 LRTP CM projects are included in Table 5.3. Figures 5.4, 5.5, 5.6, and 5.7 illustrate locations of CM projects in the Region.

Table 5.3 includes the following information about each project:

- Project ID Number;
- County;
- Roadway Name;
- Assumed feasible implementation period;
- Mileage (length of project in miles);
- Cost (in millions of 2020/YOE dollars; TIP project costs in the year in which the funds are committed);
- TIP (Yes = in TIP, YP = partially in TIP (e.g. PE/ROW Phases only), NF = committed project with local funds or federal funds outside the TIP years, No = not in TIP/not funded); and
- Description of project.

All 212 CM projects can be categorized by project type as follows:

- Studies – 1 project;
- Road or Bridge Widening – 28 projects;
- Interchange, Intersection Improvement, Turn Lane Additions – 127 projects;
- Road/Bridge Replacement, Realignment, or Reconstruction – 14 projects;
- Signal Improvement or Signal Interconnect – 3 projects;
- Bike/Pedestrian – 12 projects;
- New Road, New Interchange, or Road Extension – 12 projects; and
- Road Diets – 15 projects.

5.7 Status of Major Projects

This section provides a brief update on major and regionally significant projects that have been completed since the adoption of the last Plan, are currently under construction, or are funded in the current SFY 2021-2024 TIP.

Downtown Dayton Sub-Corridor

Originally developed as part of the North South Transportation Initiative, this project improved I-75 between Keowee Street and Edwin C. Moses Boulevard in Downtown Dayton to address safety and capacity concerns by adding continuous through lanes, eliminating left entrance and exit ramps, and increasing the spacing between interchanges. The final phase of the project was completed in the Fall of 2016 after nearly 10 years of construction.

US 35 in Montgomery County

In 2004, MVRPC in cooperation with ODOT, conducted the US 35 Corridor Major Investment Study (MIS), to identify improvements to the US 35 corridor from I-75 to I-675. This section of US 35 is one of the oldest sections of freeway in Ohio and needs geometric improvements to address safety, congestion, and accessibility issues resulting from increased traffic and changing traffic characteristics over the last 60 years.

Divided in five phases for construction, the first three – widening mainline bridges, installing a noise wall, and improving the Smithville interchange are completed. The next phase to widen US 35 between Steve Whalen Boulevard and I-675 by adding a lane in each direction is under construction and the last phase, to improve the Woodman interchange, is funded in SFY 2023. When completed, this project will reduce peak hour congestion and improve safety throughout the corridor by correcting geometric deficiencies, improving lane continuity, and reducing crashes.

US 35 in Greene County

Completed in 2004, the Major Investment Study (MIS) evaluated the conversion of US 35 from North Fairfield Road to the Xenia Bypass to a limited access facility by eliminating the at-grade intersections at Shakertown Road, Factory Road, Alpha Road, Orchard Lane, and Valley Road.

Further study, driven by statewide funding constraints, unveiled a new alternative to convert US 35 to a "superstreet" that would address the majority of the safety concerns at a lower cost. With a superstreet, drivers traveling north on Factory Road or Orchard Lane would not be able to turn left on US 35. They would turn right and drive a short distance before making a U-turn on US 35 to travel west or to continue on Factory Road or Orchard Lane. The US 35 superstreet is currently under construction and it is expected to be completed in 2022.

A project to convert the Valley/Trebein-US 35 intersection to an interchange has completed environmental review and is currently under design, pending construction funding from the Transportation Review Advisory Council (TRAC).

US 40 Logistics Improvements

This project, currently under construction, improves US 40 from Airpark Boulevard to Peters Pike to a five-lane cross section and upgrades the interchange at Airport Access Road and US 40 to facilitate the movement of freight.

Major Bridge Replacements

The Webster Street, Helena Street, Harshman Road, and Keowee Street bridges were completed between 2016 and 2019. The Third Street bridge in Downtown Dayton is currently under construction.

I-75/SR 725 Interchange

As one of the busiest roads in the Region, the SR 725 at I-75 interchange has long been a source of congestion and safety concerns. This project will convert the existing interchange to a diverging diamond interchange (DDI) and install a bike and pedestrian facility along SR 725. DDIs reduce vehicle-to-vehicle conflict points by nearly 50 percent and eliminate many of the most severe crash types, mainly left-turn and angle.

5.8 Fiscal Constraint

The Congestion Management projects in the 2050 LRTP are fiscally constrained, with a total cost of $2,326.89 million and a total projected revenue of $2,959.46 million when expressed in year of expenditure dollars. Table 5.1 shows a summary of costs and revenues by timeframe. Project costs, for projects outside the TIP, were inflated using FY 2021, U.S. Office of Management and Budget, U.S. Budget Economic Assumptions for Consumer Price Index for FY 2030 or 2.3 percent per year. This resulted in inflation factors of 1.1, 1.20, 1.41, and 1.77 for years 2025, 2030, 2035 and 2045, the mid-years of the Plan periods (2021-2025), (2026-2030), (2031-2040), and (2041-2050). A few projects outside the TIP years were not inflated because their cost estimates reflect ODOT's Ellis and are already inflated according to ODOT guidelines. These projects are identified in Table 5.3 as TIP: NF. Complete documentation of the revenue forecast, can be found in the Financial Summary Report.

Table 5.1 — Fiscal Constraint of the 2050 LRTP Projects (in millions of 2020 / Year of Expenditure dollars)

Costs / Revenues	Short Term Plan I (2021-2025)	Short Term Plan II (2026-2030)	Long Term Plan I (2031-2040)	Long Term Plan II (2041-2050)	For Full 30 Year Plan
2020					
– Cost	$78.29	$326.27	$647.34	$541.13	$1,593.03
– Revenues	$244.84	$357.94	$715.88	$715.88	$2,034.54
YOE					
– Cost	$79.43	$376.91	$912.75	$957.80	$2,326.89
– Revenues	$253.43	$429.53	$1,009.39	$1,267.11	$2,959.46

Source: MVRPC

Recognizing that the transportation system cannot be sustained in the long term without proper maintenance, MVRPC includes operations and maintenance/reconstruction projects as part of its revenue forecast. The forecast is based on actual programmed projects on the TIP and historical expenditures derived from the annual local project sponsor survey. The current forecast shows that the Region is expending approximately 46% of TIP revenues for operations and maintenance/reconstruction projects and 72% of local roadway expenditures on operations and maintenance/reconstruction on projects not programmed in the TIP for a total of $4,240.00 million over the life of the Plan, SFY 2021 to SFY 2050.

The assumption is that these funds ($4,240.00) will be reserved for operations and maintenance/reconstruction projects and will be sufficient to maintain the transportation system. Table 5.2 shows operations and maintenance/reconstruction costs and revenues for each Plan period by funding source.

Table 5.2 — 2050 Operations and Maintenance/Reconstruction Costs and Revenues by Funding Source (in millions of 2020 / Year of Expenditure dollars)

Source	Costs / Revenues				
	Short Term Plan I (2021-2025)	Short Term Plan II (2026-2030)	Long Term Plan I (2031-2040)	Long Term Plan II (2041-2050)	For Full 30 Year Plan
Federal	$209.25	$218.15	$436.31	$436.31	1,300.02
State	$108.79	$129.18	$258.36	$258.36	$754.68
Local, Other	$154.72	$149.40	$298.81	$298.81	$901.74
Total (2020 Dollars)	**$472.76**	**$496.74**	**$993.47**	**$993.47**	**$2,956.44**
Total (YOE Dollars)	**$484.68**	**$596.08**	**$1,400.79**	**$1,758.44**	**$4,240.00**

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

5 GRE **I-675 / Grange Hall Road**

Feasible: 2041-2045 Mileage: NA Cost: $30.00 / $53.10 TIP: No

Add full movements at Grange Hall Road interchange.

9A GRE **US 35 — Phase I**

Feasible: 2041-2045 Mileage: 1.50 Cost: $79.70 / $141.07 TIP: No

Eliminate the existing at grade intersections at Factory Road, Alpha Road, and Orchard Lane and replace them with full access interchange at Factory Road.

9B GRE **US 35 — Phase II**

Feasible: 2026-2030 Mileage: 1.00 Cost: $30.07 / $30.07 TIP: YP

Eliminate the existing at grade intersection at Trebein/Valley Road and replace with full access interchanges at Trebein/Valley Road. Preliminary engineering and right of way phases are currently funded in the TIP.

10B GRE **US 42**

Feasible: 2036-2040 Mileage: 0.62 Cost: $1.65 / $2.33 TIP: No

Widen from 2 to 3 lanes from Bickett Road to Hickman Road.

10D GRE **US 42**

Feasible: 2031-2035 Mileage: 0.81 Cost: $2.16 / $3.05 TIP: No

Widen US 42 from E. Church Street to City Corporation Limits from 2 to 3 lanes.

17B GRE **SR 72**

Feasible: 2021-2025 Mileage: 4.80 Cost: $7.17 / $7.17 TIP: Yes

Widen at intersections, safety upgrades and roadway realignment as needed from north of Klontz Road to southern Cedarville corporation limit.

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21 GRE **SR 235**

Feasible: 2026-2030 Mileage: 1.00 Cost: $3.90 / $4.68 TIP: No

Widen from 2 to 3 lanes from I-675 to Byron Road.

24B GRE **SR 444 — Phase III**

Feasible: 2021-2025 Mileage: 1.00 Cost: $3.27 / $3.27 TIP: NF

Narrow the western portion and widen the eastern portion to create a uniform 3-lane section from Central Avenue to Sandhill Road.

24C GRE **SR 444 — Phase IIA**

Feasible: 2021-2025 Mileage: 0.51 Cost: $3.69 / $3.69 TIP: Yes

Narrow the roadway from 4 to 3 lanes and install bike lanes and access management techniques, as well as replace the waterline from Dayton Drive to Koogler Street.

24D GRE **SR 444 — Phase IIB**

Feasible: 2026-2030 Mileage: 0.55 Cost: $1.78 / $2.14 TIP: No

Narrow the roadway from 4 to 3 lanes and install bike lanes and access management techniques from Koogler Street to Central Avenue.

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50 GRE **Garland Extension - West**

Feasible: 2036-2040 Mileage: 0.70 Cost: $3.00 / $4.23 TIP: No

Extend as 2 lanes from its eastern terminus at Maple Avenue to Meadowlands Drive.

53B GRE **Grange Hall Road**

Feasible: 2026-2030 Mileage: 1.63 Cost: $8.61 / $10.33 TIP: No

Widen from Summerfield Drive to Southview Drive and SR 835 to Patterson Road from 2 to 3 lanes, and add pedestrian and bicycle amenities.

53C GRE **Grange Hall Road**

Feasible: 2021-2025 Mileage: 0.67 Cost: $3.70 / $3.70 TIP: Yes

Widen from Summerfield Drive to Kemp Road from 2 to 3 lanes, and add pedestrian and bicycle amenities.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

58D GRE **Kemp Road**

Feasible: 2026-2030 Mileage: 1.00 Cost: $5.30 / $6.36 TIP: No

Widen from North Fairfield Road to Hidden Woods Boulevard from 2 to 3 lanes, and add bicycle and pedestrian amenities.

58E GRE **Kemp Road**

Feasible: 2031-2035 Mileage: 1.55 Cost: $3.73 / $5.26 TIP: No

Widen Kemp Road from 2 to 3 lanes from Meadowcourt Drive to Blue Wing Drive. Add bicycle and pedestrian amenities from Meadowcourt Drive to North Fairfield Road.

66C GRE **New Germany-Trebein Road**

Feasible: 2026-2030 Mileage: 0.35 Cost: $1.95 / $2.34 TIP: No

Widen from 3 to 5 lanes from Lillian Lane to Big Woods Drive.

74 GRE **Shakertown Road**

Feasible: 2031-2035 Mileage: 2.02 Cost: $10.64 / $15.00 TIP: No

Widen from 2 to 3 lanes from Autumn Leaf Drive to relocated Shakertown Road with bicycle and pedestrian amenities.

78C GRE **Trebein Road**

Feasible: 2036-2040 Mileage: 2.00 Cost: $6.20 / $8.74 TIP: No

Widen from 2 to 3 lanes fom Dayton-Yellow Springs Road to Xenia Drive; add bicycle and pedestrian facilities, widen culverts, and improve safety of vertical and horizontal curves.

345 GRE **Industrial Boulevard Extension**

Feasible: 2031-2035 Mileage: 0.47 Cost: $0.93 / $1.31 TIP: No

Extend as 3 lanes from Bellbrook Avenue to W. Second Street.

407 GRE **I-675/Shakertown Rd.**

Feasible: 2046-2050 Mileage: NA Cost: $0.75 / $1.33 TIP: No

Feasibility study to construct new interchange on I-675 at Shakertown Road to improve job access to land in Beavercreek and Kettering.

411A GRE **North Fairfield Road**

Feasible: 2021-2025 Mileage: 0.49 Cost: $3.25 / $3.25 TIP: Yes

Widen from 2 to 3 lanes from Plantation Place to Shakertown Road including installation of bicycle and pedestrian amenities.

411B GRE **North Fairfield Road**

Feasible: 2021-2025 Mileage: 0.18 Cost: $2.12 / $2.12 TIP: NF

Widen from 2 to 3 lanes from Plantation Place to Fairbrook Elementary School including installation of bicycle and pedestrian amenities.

411C GRE **North Fairfield Road**

Feasible: 2026-2030 Mileage: 0.36 Cost: $2.90 / $3.48 TIP: No

Widen from 2 to 3 lanes from Fairbrook Elementary School to Indian Ripple Road including installation of bicycle and pedestrian amenities.

414 GRE **Funderburg Road**

Feasible: 2031-2035 Mileage: 1.30 Cost: $3.40 / $4.79 TIP: No

Widen from 2 to 3 lanes from Colonel Glenn Road to Dayton Yellow Springs Road.

415 GRE **Garland Avenue Extension**

Feasible: 2036-2040 Mileage: 0.90 Cost: $4.50 / $6.35 TIP: No

Extend as 2 lanes from Trebein Road to SR 235.

417 GRE **Schwerman Drive**

Feasible: 2036-2040 Mileage: 1.00 Cost: $2.70 / $3.81 TIP: No

Widen from 2 to 3 lanes from Adams Street to SR 444 including improvements to the Sandhill Road intersection.

425 GRE **Upper Bellbrook Road**

Feasible: 2026-2030 Mileage: 0.38 Cost: $1.44 / $1.73 TIP: No

Widen from 2 to 3 lanes from Colorado Drive to Progress Drive including a pedestrian path.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

431 GRE **Valley Springs Connector Road**

Feasible: 2026-2030 Mileage: 0.82 Cost: $2.50 / $3.00 TIP: No

Provide a 3-lane connector road from Orchard Lane to the proposed Valley Road / US 35 interchange.

433 GRE **US 35**

Feasible: 2031-2035 Mileage: 1.00 Cost: $9.00 / $12.69 TIP: No

Reconfigure the US 35 and Business 35 interchange located on the west side of Xenia for safety and operational purposes.

443 GRE **Indian Ripple Road**

Feasible: 2031-2035 Mileage: 1.69 Cost: $8.90 / $12.55 TIP: No

Widening from 2 to 3 lanes from Grange Hall Road to Alpha Bellbrook Road including installation of bicycle and pedestrian amenities.

451 GRE **Fairborn Schools Street Upgrades**

Feasible: 2031-2035 Mileage: 2.00 Cost: $5.20 / $7.33 TIP: No

Widening Garland and Trebein Roads from 2 to 3 lanes, and adding turn lanes on Commerce Center for future school expansion on the adjacent property.

452 GRE **Maple Avenue — Phase II**

Feasible: 2021-2025 Mileage: 1.10 Cost: $3.53 / $3.53 TIP: Yes

Widen from 2 lanes to 3 and add bike lanes from Doris Drive to Dayton-Yellow Springs Road.

453 GRE **Kauffman Avenue**

Feasible: 2026-2030 Mileage: 2.00 Cost: $5.20 / $6.24 TIP: No

Left turn lanes and right turn drop lanes will be added at intersections from National Road to Colonel Glenn Highway.

454 GRE **Garland Avenue Bike Path**

Feasible: 2026-2030 Mileage: 1.05 Cost: $0.92 / $1.10 TIP: No

Install a bike path on City-owned property from the proposed bike lanes on Maple Avenue to the existing path on Garland Avenue near I-675.

455 GRE **Van Eaton Road / Hedges Road Intersection**

Feasible: 2041-2045 Mileage: NA Cost: $1.32 / $2.34 TIP: No

Intersection realignment to eliminate offset intersection.

456 GRE **East Main Street / North Patton Street / Jasper Road**

Feasible: 2031-2035 Mileage: NA Cost: $2.25 / $3.17 TIP: No

Reconstruct a five (5) point intersection with a roundabout.

457A GRE **Dayton-Xenia Road Widening**

Feasible: 2026-2030 Mileage: 0.30 Cost: $2.39 / $2.87 TIP: No

Widen Dayton-Xenia Road from 3 to 5 lanes from Meadow Bridge to Hanes Road. The project will also include signal work, bicycle and pedestrian amenities.

457B GRE **Dayton-Xenia Road Widening**

Feasible: 2031-2035 Mileage: 1.33 Cost: $8.76 / $12.35 TIP: No

Widen Dayton-Xenia Road between Hanes Road and Beaver Valley Road from 2 to 3 lanes including installation of bicycle and pedestrian amenities.

458 GRE **Lantz Road Extension**

Feasible: 2026-2030 Mileage: 0.35 Cost: $2.77 / $3.32 TIP: No

Extend Lantz Road from Dayton-Xenia Road to North Fairfield Road. The project will inlcude a new signal at Dayton-Xenia Road, and bicycle and pedestrian facilities.

459 GRE **Dayton-Xenia Road at High School Road**

Feasible: 2026-2030 Mileage: 0.20 Cost: $0.75 / $0.90 TIP: No

Installation of a new traffic signal for the East Beavercreek High School Road at Dayton-Xenia Road. This will also include pedestrian, bicycle and lane upgrades.

460 GRE **Hanes Road**

Feasible: 2036-2040 Mileage: 2.10 Cost: $12.20 / $17.20 TIP: No

Widen Hanes Road from 2 to 3 lanes from Dayton-Xenia Road to Kemp Road with bicycle/pedestrian facilities.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

461 GRE **Kemp Road Widening**

Feasible: 2031-2035 Mileage: 1.03 Cost: $5.42 / $7.64 TIP: No

Widen Kemp Road from the west corporation line to Grange Hall Road from 2 to 3 lanes with bicycle and pedestrian facilities.

462 GRE **Alpha-Bellbrook Road**

Feasible: 2036-2040 Mileage: 1.23 Cost: $7.75 / $10.93 TIP: No

Widen Apha-Bellbrook Road from Indian Ripple Road to Shakertown Road from 2 to 3 laneswith bicycle and pedestrian facilities.

463 GRE **North Fairfield Road / Swigart Road Roundabout**

Feasible: 2036-2040 Mileage: 0.20 Cost: $0.75 / $1.06 TIP: No

Reconstruct the intersection of North Fairfield Road and Swigart Road with a roundabout.

464 GRE **North Fairfield Road Widening**

Feasible: 2036-2040 Mileage: 0.56 Cost: $3.15 / $4.44 TIP: No

Widen North Fairfield Road from Swigart Road to Indian Ripple Road from 2 to 3 lanes and add bicycle and pedestrian facilities.

465 GRE **Darst Road**

Feasible: 2036-2040 Mileage: 1.12 Cost: $6.09 / $8.59 TIP: No

Widen Darst Road from Swigart Road to Indian Ripple Road from 2 to 3 lanes with bicycle and pedestrian facilities.

466 GRE **Indian Ripple Road/I-675 Sidepath**

Feasible: 2036-2040 Mileage: 0.22 Cost: $0.74 / $1.04 TIP: No

Extend the bicycle and pedestrian facilities west of the I-675/Indian Ripple Road interchange over I-675 to the existing bicycle/pedestrian facilities at Sylvania.

467 GRE **New Germany-Trebein Road Sidepath**

Feasible: 2036-2040 Mileage: 1.35 Cost: $3.56 / $5.02 TIP: No

Extend existing bicycle and pedestrian facilities along New Germany-Trebein Road from Big Woods Drive to Varner Drive.

468 GRE **Grange Hall Road**

Feasible: 2041-2045 Mileage: 2.41 Cost: $12.70 / $22.48 TIP: No

Widen Grange Hall Road from Patterson Road to Indian Ripple Road from 2 to 3 lanes. The project will also include bicycle and pedestrian facilities.

469 GRE **Lantz Road Sidepath**

Feasible: 2041-2045 Mileage: 1.33 Cost: $3.87 / $6.85 TIP: No

Add bicycle and pedestrian facilities along Lantz/McKay Roads from Hanes Road to Beaver Valley Road.

470 GRE **Lantz Road Widening**

Feasible: 2041-2045 Mileage: 0.64 Cost: $3.36 / $5.95 TIP: No

Widen Lantz Road between North Fairfield Road and Hanes Road from 2 to 3 lanes with bicycle and pedestrian facilities.

471 GRE **Kemp Road**

Feasible: 2046-2050 Mileage: 1.28 Cost: $6.75 / $11.95 TIP: No

Widen Kemp Road from Hidden Woods to Beaver Valley Road from 2 to 3 lanes with bicycle and pedestrian facilities. Relocate roadway to remove S curves.

472 GRE **Patterson Road Widening**

Feasible: 2046-2050 Mileage: 1.88 Cost: $9.93 / $17.58 TIP: No

Widen Patterson Road from County Line Road to SR 835 from 2 to 3 lanes with bicycle and pedestrian facilities.

473 GRE **Swigart Road Sidepath**

Feasible: 2046-2050 Mileage: 0.83 Cost: $2.19 / $3.88 TIP: No

Install bicycle and pedestrian facilities along Swigart Road from Darst Road to North Fairfield Road.

474 GRE **Research Blvd (SR 835)/Seajay Drive Sidepath**

Feasible: 2046-2050 Mileage: 0.75 Cost: $1.98 / $3.50 TIP: No

Extend the City bicycle and pedestrian facilities from Patterson Road to North Fairfield Road along SR 835 and Seajay Drive.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

475 GRE **Beaver Valley Road Sidepath**

Feasible: 2046-2050 Mileage: 1.45 Cost: $4.22 / $7.47 TIP: No

Extend bicycle and pedestrian facilities along Beaver Valley Road from Dayton-Xenia Road to Lantz Road.

476 GRE **GRE-235**

Feasible: 2026-2030 Mileage: 0.75 Cost: $2.00 / $2.40 TIP: No

Construct adjacent roundabouts at the intersections of GRE-235 with Byron and Trebein Roads.

477 GRE **GRE-675**

Feasible: 2031-2035 Mileage: 1.00 Cost: $2.00 / $2.82 TIP: No

Widen exit ramp from I-675 to WPAFB, Colonel Glenn Highway from 2 to 3 lanes.

478 GRE **GRE-42**

Feasible: 2031-2035 Mileage: 0.30 Cost: $5.00 / $7.05 TIP: No

Change intersection of US 42 and Brush Row Road and US 42 and N. Bickett Road into adjacent roundabouts.

479 GRE **GRE-68**

Feasible: 2031-2035 Mileage: N/A Cost: $2.00 / $2.82 TIP: No

Construct a roundabout at the intersection of US 68 and Hyde Road.

480 GRE **GRE-235**

Feasible: 2031-2035 Mileage: 1.25 Cost: $1.50 / $2.12 TIP: No

Reduce SR 235 from 4 lanes to 2 from SLM 9.00-10.30.

481 GRE **GRE-42**

Feasible: 2026-2030 Mileage: 0.17 Cost: $2.00 / $2.40 TIP: No

Construct sidewalk and crossing between Cedarville Meadows subdivision and Cedarville High School.

482 GRE **S. Detroit, Miami and Home Intersection Improvements**

Feasible: 2026-2030 Mileage: NA Cost: $2.02 / $2.42 TIP: No

Reconstruct a skewed intersection at S. Detroit Street, Miami Avenue and Home Avenue with a roundabout. Install new sidewalk and provide a better connection for the Ohio to Erie Bike Path to the Xenia Station Bike Hub.

483 GRE **Hospitality Drive**

Feasible: 2026-2030 Mileage: 0.40 Cost: $1.98 / $2.38 TIP: No

Widening Hospitality Drive from W. Main Street to S. Progress Drive from 3 to 5 lanes.

484 GRE **Progress Drive**

Feasible: 2026-2030 Mileage: 0.97 Cost: $3.25 / $3.90 TIP: No

Widen Progress Drive from W. Second Street to Dayton Xenia Road from 3 to 5 lanes.

485 GRE **N. Progress Drive / Greene Way Boulevard Intersection**

Feasible: 2026-2030 Mileage: NA Cost: $0.50 / $0.60 TIP: No

Add a mast arm signal to the intersection of N. Progress Drive and Greene Way Boulevard.

486 GRE **Valley-Bell Connector Road**

Feasible: 2031-2035 Mileage: 1.20 Cost: $4.12 / $5.81 TIP: No

New road to connect Indian Ripple Road and Valley Road at the Lewis A. Jackson Greene County Regional Airport.

89A MIA **I-75 — Phase I**

Feasible: 2036-2040 Mileage: 2.89 Cost: $41.15 / $58.02 TIP: No

Rehabilitate and widen from 4 to 6 lanes from 1.13 miles north of SR 41 to 0.42 miles north of CR 15 (Piqua-Troy Road).

89B MIA **I-75 — Phase II**

Feasible: 2041-2045 Mileage: 4.04 Cost: $37.75 / $66.82 TIP: No

Rehabilitate and widen from 4 to 6 lanes from 0.42 miles north of CR 15 (Piqua Troy Road) to CR 25A.

96 MIA **SR 41**

Feasible: 2026-2030 Mileage: 0.60 Cost: $2.03 / $2.44 TIP: No

Widen from 2 to 5 lanes from just west of Kings Chapel Drive to Washington Road.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

103 MIA **Commerce Boulevard — Phase III**

Feasible: 2031-2035 Mileage: 0.60 Cost: $3.60 / $5.08 TIP: No

Extend Commerce Center Boulevard from its eastern terminus to intersect SR 718 at Barnhard Road.

105B MIA **County Road 25A — Phase V**

Feasible: 2036-2040 Mileage: 1.51 Cost: $6.04 / $8.52 TIP: No

Widen from 2 to 4/5 lanes from the Montgomery County line to Evanston Road.

108 MIA **Donn Davis Way Connection**

Feasible: 2036-2040 Mileage: 1.00 Cost: $4.30 / $6.06 TIP: No

Extend as 3/4 lanes from Kessler-Cowlesville Road to the existing Donn Davis Way at Parkwood Avenue, crossing North Hyatt Street north of Arapaho Trail.

112 MIA **Evanston Road**

Feasible: 2026-2030 Mileage: 0.50 Cost: $4.90 / $5.88 TIP: No

Widen from 2 to 3 lanes from CR 25A to I-75 including a proposed bike/pedestrian crossing over I-75 (attached to existing overpass) and construct either an on- or off-street bike/pedestrian path.

113 MIA **Experiment Farm Road**

Feasible: 2031-2035 Mileage: 0.33 Cost: $1.56 / $2.20 TIP: No

Widen from 2 to 5 lanes from just north of Corporate Drive to Eldean Road.

113A MIA **Eldean Road / Experiment Farm Road**

Feasible: 2026-2030 Mileage: 0.33 Cost: $1.75 / $2.10 TIP: No

Realign the offset intersection.

121 MIA **McKaig Road**

Feasible: 2026-2030 Mileage: 1.40 Cost: $2.02 / $2.42 TIP: No

Widen from 2 to 3 lanes from Dorset Road to Cartwright Court.

139A MIA **Washington Road / Wilson Road**

Feasible: 2026-2030 Mileage: 0.74 Cost: $1.35 / $1.62 TIP: No

Realign Washington Road to intersect Wilson Road at McKaig Road.

371 MIA **SR 41**

Feasible: 2026-2030 Mileage: 0.51 Cost: $1.13 / $1.36 TIP: No

Widen from 5 to 7 lanes from Experiment Farm Road to I-75.

501 MIA **Tipp-Cowlesville Road**

Feasible: 2026-2030 Mileage: 1.31 Cost: $3.50 / $4.20 TIP: No

Widen from 2 to 3 lanes from Crane Road to CR 25A.

507 MIA **Swailes Road Extension**

Feasible: 2036-2040 Mileage: 0.70 Cost: $1.35 / $1.90 TIP: No

New roadway extension from the western termini of Swailes Road at Nashville Road to Wilson Road at SR 55.

508A MIA **Peters Road — Phase I**

Feasible: 2026-2030 Mileage: 0.41 Cost: $1.24 / $1.49 TIP: No

Widen from 2 to 3 lanes from Dickerson Drive to Premwood Road.

508B MIA **Peters Road — Phase II**

Feasible: 2031-2035 Mileage: 0.80 Cost: $1.96 / $2.76 TIP: No

Widen from 2 to 3 lanes from Premwood Road to Swailes Road.

512A MIA **Eldean Road — Phase I**

Feasible: 2026-2030 Mileage: 1.20 Cost: $3.00 / $3.60 TIP: No

Widen from 2 to 3 lanes from Experiment Farm Road to CR 25A.

512B MIA **Eldean Road — Phase II**

Feasible: 2026-2030 Mileage: 1.03 Cost: $2.57 / $3.08 TIP: No

Widen from 2 to 3 lanes from Washington Road to Experiment Farm Road.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

512C MIA **Eldean Road — Phase III**

Feasible: 2031-2035 Mileage: 1.14 Cost: $2.85 / $4.02 TIP: No

Widen from 2 to 3 lanes from SR 41 to Washington Road.

514 MIA **Piqua-Troy Road**

Feasible: 2031-2035 Mileage: 1.19 Cost: $2.98 / $4.20 TIP: No

Widen from 2 to 3 lanes from the Troy north corporation limit to Troy-Sidney Road.

516A MIA **Washington Road — Phase I**

Feasible: 2026-2030 Mileage: 1.87 Cost: $4.68 / $5.62 TIP: No

Widen from 2 to 3 lanes from SR 718 to 0.6 miles south of SR 41.

516B MIA **Washington Road — Phase II**

Feasible: 2031-2035 Mileage: 0.81 Cost: $2.03 / $2.86 TIP: No

Widen from 2 to 3 lanes from SR 41 to Eldean Road.

516C MIA **Washington Road — Phase III**

Feasible: 2036-2040 Mileage: 1.94 Cost: $4.85 / $6.84 TIP: No

Widen from 2 to 3 lanes from Eldean Road to Farrington Road.

517B MIA **Farrington Road — Phase II**

Feasible: 2026-2030 Mileage: 1.03 Cost: $2.58 / $3.10 TIP: No

Widen Farrington Road from 2 to 3 lanes from Washington Road to Experiment Farm Road.

518B MIA **Kinna Drive — South**

Feasible: 2031-2035 Mileage: 0.50 Cost: $2.20 / $3.10 TIP: No

Construct a 3-lane extension from the current south terminus of Kinna Drive to Evanston Road.

520A MIA **Peters Road — Phase I**

Feasible: 2026-2030 Mileage: 2.09 Cost: $5.23 / $6.28 TIP: No

Widen from 2 to 3 lanes from Kessler-Cowlesville Road to Swailes Road.

520B MIA **Peters Road — Phase II**

Feasible: 2031-2035 Mileage: 1.10 Cost: $2.75 / $3.88 TIP: No

Widen from 2 to 3 lanes from SR 571 to Kessler-Cowlesville Road.

528 MIA **I-75 / SR 571**

Feasible: 2036-2040 Mileage: NA Cost: $1.61 / $2.27 TIP: No

Interchange modification to improve capacity of existing ramps and replace structure with 5-lane capacity structure.

530 MIA **Riverside Drive**

Feasible: 2021-2025 Mileage: 0.46 Cost: $1.94 / $2.17 TIP: No

Widen from 2 to 3 lanes from 600 feet north of Adams Street to the Duke Park north boundary.

531D MIA **Main Street — Streetscape**

Feasible: 2026-2030 Mileage: 0.25 Cost: $1.50 / $1.80 TIP: No

Rehabilitate and improve West Main Street / SR 571 from Hyatt Street eastward to the CSX Railroad Tracks; including an interconnection among the existing traffic signals.

532 MIA **Experiment Farm Road**

Feasible: 2036-2040 Mileage: 1.96 Cost: $4.90 / $6.91 TIP: No

Widen from 2 to 3 lanes from Eldean Road to Farrington Road.

537A MIA **SR 41 Traffic Signal Interconnect**

Feasible: 2021-2025 Mileage: NA Cost: $0.41 / $0.41 TIP: Yes

Extend communication backbone to allow traffic signals to operate as a closed loop system at the intersections with Dorset Road and Marybill Drive.

546 MIA **CR 25A/Looney Road Intersection Improvement Project**

Feasible: 2026-2030 Mileage: NA Cost: $2.04 / $2.45 TIP: No

Construction of a roundabout at the intersection of Looney Road and CR 25A.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

547 MIA **Tipp City I-75 Pedestrian Bridge**

Feasible: 2036-2040 Mileage: 0.30 Cost: $10.00 / $14.10 TIP: No

Construct a pedestrian bridge over I-75 at Kessler-Cowlesville Road.

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643 MIA **SR 201 — Phase VIII**

Feasible: 2026-2030 Mileage: 0.16 Cost: $1.70 / $2.04 TIP: No

Widen from 2 to 4 lanes from Montgomery County line to Singer Road; including a grass median island, curb, gutter, storm drainage system, and landscaping enhancements.

144C MOT **I-70**

Feasible: 2031-2035 Mileage: 7.70 Cost: $53.31 / $75.17 TIP: No

Rehabilitate and widen from 4 to 6 lanes; beginning at Arlington Road to SR-48. (Interchange improvements will be included on this project if the Interchange Modification Study requires any improvements.)

147E MOT **I-75**

Feasible: 2046-2050 Mileage: 8.80 Cost: $225.43 / $399.01 TIP: No

Safety upgrade and modernization of I-75 from I-675 to Edwin C. Moses Boulevard including widening from 6 to 8 lanes.

147F MOT **I-75**

Feasible: 2046-2050 Mileage: 2.70 Cost: $79.21 / $140.20 TIP: No

Safety upgrade and modernization of I-75 from Wagner Ford Road to Benchwood Wyse Road including widening from 6 to 8 lanes.

154F MOT **US 35 — Phase III**

Feasible: 2021-2025 Mileage: 0.78 Cost: $11.07 / $11.07 TIP: Yes

US 35 at Woodman Drive / SR 835 interchange modification.

155D MOT **US 35**

Feasible: 2036-2040 Mileage: 2.00 Cost: $5.95 / $8.39 TIP: No

Widen from 2 to 3 lanes from Union Road to Lutheran Church Road.

155E MOT **US 35**

Feasible: 2036-2040 Mileage: 1.00 Cost: $2.73 / $3.85 TIP: No

Widen from 2 to 3 lanes from Lutheran Church Road to Diamond Mill Road.

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167 MOT **SR 48**

Feasible: 2031-2035 Mileage: 1.67 Cost: $3.01 / $4.24 TIP: No

Widen from 2 to 5 lanes from the Warren County line to Sheehan Road.

184B MOT **SR 725**

Feasible: 2031-2035 Mileage: 1.00 Cost: $8.00 / $11.28 TIP: No

Widen from 2 to 5 lanes from Bigger Road to Wilmington Pike.

202E MOT **Social Row Road — Phase I**

Feasible: 2021-2025 Mileage: 0.40 Cost: $6.11 / $6.11 TIP: NF

Widen from 2 to 5 lanes from Waterbury Ridge Lane to Paragon Road.

202F MOT **Social Row Road — Phase II**

Feasible: 2026-2030 Mileage: 0.28 Cost: $3.90 / $4.68 TIP: No

Widen from 2 to 5 lanes from Paragon Road to Sheehan Road.

202G MOT **Social Row Road — Phase III**

Feasible: 2026-2030 Mileage: 1.00 Cost: $3.90 / $4.68 TIP: No

Widen from 2 to 3 lanes from Sheehan Road to SR 48.

209A MOT **Arlington Road**

Feasible: 2036-2040 Mileage: 1.20 Cost: $6.30 / $8.88 TIP: No

Widen from 2 to 3 lanes from I-70 to US 40.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

220 MOT **Clyo Road**

Feasible: 2036-2040 Mileage: 2.42 Cost: $8.50 / $11.99 TIP: No

Widen from 2 to 3 lanes from Spring Valley Road to Social Row Road.

221B MOT **Clyo Road**

Feasible: 2031-2035 Mileage: 0.72 Cost: $3.00 / $4.23 TIP: No

Widen from 2 to 3 lanes from St. Leonard's Way to south corporation limits.

244C MOT **Hoke Road**

Feasible: 2026-2030 Mileage: 0.38 Cost: $3.89 / $4.67 TIP: No

Widen from 2 to 3 lanes from Wenger Road to Smith Drive, including intersection improvements and traffic signals at Wenger Road.

244D MOT **Hoke Road**

Feasible: 2026-2030 Mileage: 0.9 Cost: $5.35 / $6.42 TIP: No

Widen from 2 to 3 lanes from Wenger Road to US 40.

253 MOT **Little Richmond Road / Diamond Mill Road**

Feasible: 2046-2050 Mileage: NA Cost: $2.00 / $3.54 TIP: No

Correct the split-T intersection at Diamond Mill Road.

260 MOT **Mad River Road**

Feasible: 2036-2040 Mileage: NA Cost: $3.50 / $4.94 TIP: No

Improve and realign intersections of Yankee Street and Munger Road.

272B MOT **North Dixie Drive**

Feasible: 2031-2035 Mileage: 0.80 Cost: $2.50 / $3.53 TIP: No

Widen from 2 to 3 lanes from the Vandalia north corporation limit to the Miami County line.

298 MOT **Salem Avenue**

Feasible: 2036-2040 Mileage: 1.10 Cost: $9.50 / $13.40 TIP: No

Widen from 4 to 5 lanes from Hillcrest Avenue to Curundu Avenue.

335B MOT **Yankee Street — Phase III**

Feasible: 2031-2035 Mileage: 0.75 Cost: $6.00 / $8.46 TIP: No

Widen from 2 to 5 lanes from Winding Green Way to Spring Valley Pike.

335C MOT **Yankee Street — Phase IV**

Feasible: 2036-2040 Mileage: 0.55 Cost: $2.45 / $3.45 TIP: No

Widen from 3 to 5 lanes from Social Row Road/Austin Pike to Winding Green Way.

336 MOT **Yankee Street**

Feasible: 2031-2035 Mileage: 0.60 Cost: $7.00 / $9.87 TIP: No

Widen from 2 to 3 lanes from Social Row Road/Austin Boulevard to Warren County Line.

338C MOT **Miamisburg-Springboro Pike, Section 1 — Phase II**

Feasible: 2031-2035 Mileage: 0.50 Cost: $5.00 / $7.05 TIP: No

Widen from 3 to 5 lanes from Peacock Lane to Medlar Road.

338D MOT **Miamisburg-Springboro Pike, Section 2 — Phase I**

Feasible: 2026-2030 Mileage: 0.90 Cost: $8.50 / $10.20 TIP: No

Widen from 2 to 3 lanes from Medlar Road to Benner Road.

338E MOT **Miamisburg-Springboro Pike, Section 2 — Phase II**

Feasible: 2036-2040 Mileage: 0.90 Cost: $6.00 / $8.46 TIP: No

Widen from 3 to 5 lanes from Medlar Road to Benner Road.

338F MOT **Benner Road**

Feasible: 2026-2030 Mileage: 1.40 Cost: $8.53 / $10.24 TIP: No

Widen from 2 to 3 lanes from Dayton-Cincinnati Pike to Miamisburg-Springboro Pike.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

338G MOT **I-75**

Feasible: 2026-2030 Mileage: 2.62 Cost: $43.00 / $43.00 TIP: NF

Widen from 6 to 8 lanes from approximately Pennyroyal Lane to I-675.

372A MOT **Spring Valley Road - Phase I**

Feasible: 2036-2040 Mileage: 1.40 Cost: $4.50 / $6.35 TIP: No

Widen from 2/3 to 5 lanes from SR 48 to Clyo Road.

372B MOT **Spring Valley Road - Phase II**

Feasible: 2036-2040 Mileage: 2.10 Cost: $9.80 / $13.82 TIP: No

Widen from 3 to 5 lanes from Yankee Street to SR 48.

608 MOT **Brookville-Salem Road**

Feasible: 2041-2045 Mileage: 2.10 Cost: $8.00 / $14.16 TIP: No

Widen from 2 to 3 lanes from SR 49 to Brookville-Phillipsburg Road.

611A MOT **Hoke Road — South**

Feasible: 2031-2035 Mileage: 0.60 Cost: $1.60 / $2.26 TIP: No

Widen Hoke Road from 2 to 3 lanes from south of Career Drive to Westbrook Road and add traffic signals at the Westbrook intersection.

613B MOT **Union Road**

Feasible: 2041-2045 Mileage: NA Cost: $1.42 / $2.51 TIP: No

Widen from Westbrook Road to US 35 to add left turn lanes at the Shiloh Springs Road and Little Richmond Road intersections.

613C MOT **Union Road**

Feasible: 2036-2040 Mileage: 6.50 Cost: $7.00 / $9.87 TIP: No

Improve geometry from SR 4 to Fairview Drive by eliminating the horizontal curves/offsets at the Lower Miamisburg Road intersections; including an extension of Union Road along the current north/south alignment through Lower Miamisburg Road, creating a new four-leg intersection.

628A MOT **Diamond Mill Road**

Feasible: 2041-2045 Mileage: 7.80 Cost: $6.00 / $10.62 TIP: No

Improve roadway geometry and left turn lanes on Diamond Mill Road at the Upper Lewisburg-Salem Road, Westbrook Road, Air Hill/Shiloh Springs Road, Wolf Creek Pike, and Old Dayton Road intersections; including a realignment of the Shiloh Springs Road/Air Hill Road intersection.

628B MOT **Diamond Mill Road**

Feasible: 2036-2040 Mileage: 8.10 Cost: $8.00 / $11.28 TIP: No

Improve roadway geometry and add left turn lanes on Diamond Mill Road from the Germantown north corporation limit to US 35 at the Dayton-Farmersville Road, Hemple Road, Farmersville-West Carrollton Road, and Manning Road intersections; including a realignment of the Hemple Road intersection.

637 MOT **Little York Road — Phase I**

Feasible: 2026-2030 Mileage: 0.45 Cost: $6.00 / $7.20 TIP: No

Widen from 2 to 3 lanes from Miller Lane to North Dixie Drive.

647 MOT **Little York Road — Phase II**

Feasible: 2031-2035 Mileage: 1.50 Cost: $7.00 / $9.87 TIP: No

Widen from 2 to 3 lanes from North Dixie Drive to Peters Pike.

648 MOT **Little York Road — Phase III**

Feasible: 2036-2040 Mileage: 1.50 Cost: $8.50 / $11.99 TIP: No

Widen from 2 to 3 lanes from Peters Pike to Frederick Pike.

650 MOT **Frederick Pike**

Feasible: 2041-2045 Mileage: 2.00 Cost: $8.00 / $14.16 TIP: No

Widen from 2 to 3 lanes from Little York Road to US 40.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

654 MOT **Broadway Street**

Feasible: 2031-2035 Mileage: 1.00 Cost: $5.75 / $8.11 TIP: No

Realign and widen roadway from 2 to 3 lanes from Germantown Street to Edwin C. Moses Boulevard.

656 MOT **Smithville Road**

Feasible: 2026-2030 Mileage: 1.00 Cost: $6.32 / $7.58 TIP: No

Widen from 2/4 to 3/5 lanes from US 35 to Fourth Street.

661 MOT **Washington Street**

Feasible: 2026-2030 Mileage: 0.30 Cost: $3.45 / $4.14 TIP: No

Widen from 2 to 3 lanes from Perry Street to Veteran's Parkway.

665 MOT **Sheehan Road**

Feasible: 2036-2040 Mileage: 1.50 Cost: $4.00 / $5.64 TIP: No

Widen Sheehan Road from Social Row Road to Bonnie Anne Place from 2 to 3 lanes.

668 MOT **Kitridge Road**

Feasible: 2031-2035 Mileage: 0.60 Cost: $2.88 / $4.06 TIP: No

Widen from 2 to 3 lanes from Gander Road to the Dayton east corportation limit.

669 MOT **Spring Valley Pike**

Feasible: 2041-2045 Mileage: 1.20 Cost: $6.00 / $10.62 TIP: No

Widen from 2 to 3 lanes from Clyo Road to the Greene County Line.

670A MOT **Centerville Station Road — Phase I**

Feasible: 2026-2030 Mileage: 0.61 Cost: $3.60 / $4.32 TIP: No

Widen Centerville Station Road from Park East Court to Wilmington Pike from 2 to 3 lanes.

670B MOT **Centerville Station Road — Phase II**

Feasible: 2031-2035 Mileage: 0.45 Cost: $1.10 / $1.55 TIP: No

Widen Centerville Station Road from Brainard Woods Drive to Park East Court from 2 to 3 lanes.

676 MOT **I-75 / Needmore Road Interchange**

Feasible: 2036-2040 Mileage: NA Cost: $31.99 / $45.11 TIP: No

Interchange modification to improve capacity of existing ramps; widen Needmore Road bridge over I-75 to 8 lanes.

677 MOT **I-75 / Edwin C. Moses Boulevard**

Feasible: 2031-2035 Mileage: NA Cost: $5.00 / $7.05 TIP: No

Short term improvements at the interchange and nearby access points to improve traffic flow during special events.

678 MOT **I-75 / Wagner Ford Road**

Feasible: 2031-2035 Mileage: NA Cost: $54.46 / $76.79 TIP: No

Interchange modification to address geometric and operational deficiencies.

679 MOT **I-75 / SR 725**

Feasible: 2021-2025 Mileage: NA Cost: $8.24 / $8.24 TIP: Yes

Convert the existing interchange to a diverging diamond (DDI), upgrade the traffic signal at Byers Road and install sidewalk along SR 725.

680 MOT **I-75 / US 40 / Northwoods Boulevard**

Feasible: 2036-2040 Mileage: NA Cost: $38.08 / $53.69 TIP: No

Interchange modifications to reduce weaving movements.

800A MOT **West Moraine Connector — Phase I**

Feasible: 2031-2035 Mileage: 1.00 Cost: $8.25 / $11.63 TIP: No

Widen Pinnacle Road from Moraine/Jefferson Township boundary to Infirmary Road, Infirmary Road from Pinnacle Road to Hemple Road, and Hemple Road from Infirmary Road to 800 feet west of Infirmary Road; including new drainage culverts, side road drainage, bike/pedestrian paths, and realignment of the intersection at Infirmary Road and Hemple Road.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

800B MOT **West Moraine Connector — Phase II**

Feasible: 2031-2035 Mileage: 1.00 Cost: $2.70 / $3.81 TIP: No

Widen Hemple Road from 800 feet west of Infirmary Road to SR 4; including new drainage culverts, side road drainage, bike/pedestrian paths, and realignment of the intersection at Hemple Road and SR 4.

803A MOT **US 40**

Feasible: 2026-2030 Mileage: 0.30 Cost: $1.45 / $1.74 TIP: No

Widen US 40 to three lanes from Haber Road to the main entrance of the Northmont School Campus and add a traffic signal and right turn lane on Haber Road.

803B MOT **US 40**

Feasible: 2026-2030 Mileage: NA Cost: $1.00 / $1.20 TIP: No

Widen to provide left turn lanes at Arlington Road.

804 MOT **SR 48**

Feasible: 2036-2040 Mileage: 0.50 Cost: $2.80 / $3.95 TIP: No

Traffic signal upgrades, street lighting, sidewalks, curb and gutter, and drainage issues on SR 48 from Westbrook Road to Hacker Road.

808 MOT **SR 4**

Feasible: 2036-2040 Mileage: 2.00 Cost: $4.75 / $6.70 TIP: No

Upgrade intersections at Manning Road/Jamaica Road and Union Road in the communities of Moraine and Germantown including turn lanes and traffic signals.

810 MOT **Helena Street**

Feasible: 2026-2030 Mileage: 0.25 Cost: $2.88 / $3.46 TIP: No

Realign and widen from 2 to 3 lanes from Riverside Drive to Forest Avenue.

815 MOT **Dog Leg Road / Frederick Pike / Meeker Road**

Feasible: 2041-2045 Mileage: 0.50 Cost: $2.50 / $4.43 TIP: No

Install roundabout to consolidate three intersections.

816 MOT **Alex-Bell Road and Mad River Road**

Feasible: 2021-2025 Mileage: 0.50 Cost: $2.14 / $2.14 TIP: Yes

Installation of roundabout to improve traffic flow.

822B MOT **Wilmington Pike — Phase III**

Feasible: 2026-2030 Mileage: 0.37 Cost: $2.50 / $3.00 TIP: No

Widen Wilmington Pike from Clyo Road to I-675 from 6 to 8 lanes with additional through lanes and auxiliary turn lanes to add capacity.

823B MOT **I-675 / Wilmington Pike Interchange**

Feasible: 2026-2030 Mileage: NA Cost: $30.00 / $36.00 TIP: No

Long term interchange modifications to increase the capacity of the Wilmington Pike, exiting ramps, and entrance ramps.

830 MOT **East Third Street**

Feasible: 2031-2035 Mileage: 2.21 Cost: $2.30 / $3.24 TIP: No

Widening of East Third Street at Findlay and Irwin Streets for the installation of left turn lanes.

832 MOT **North Main Street**

Feasible: 2021-2025 Mileage: 3.30 Cost: $6.06 / $6.79 TIP: No

Change the 4 lane configuration to 3 lanes, including parking curb extensions, street lighting, and enhanced pedestrian crossing along North Main Street from Great Miami Boulevard to Shoup Mill Road.

833 MOT **Patterson Boulevard**

Feasible: 2026-2030 Mileage: 0.78 Cost: $2.70 / $3.24 TIP: No

Installation of left turn lanes on Patterson Boulevard at the intersections with Auto Club Drive, Lincoln Street, Stout Street, and Apple Street.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

835 MOT **Salem Avenue**

Feasible: 2026-2030 Mileage: 1.80 Cost: $4.20 / $5.04 TIP: No

Widening of Salem Avenue from 4 to 5 lanes at the intersections with Kenwood, Emerson, Wabash, and Elsmere Avenues for the installation of left turn lanes.

837B MOT **First Street**

Feasible: 2031-2035 Mileage: 1.40 Cost: $4.00 / $5.64 TIP: No

Change the lane configuration from 4 to 3 lanes, including installation of bike lanes and street lighting, on East First Street from Webster Street to Springfield Street.

838 MOT **Wayne Avenue**

Feasible: 2021-2025 Mileage: 0.56 Cost: $2.73 / $2.73 TIP: Yes

Widening of Wayne Avenue from 4 to 5 lanes from Wyoming Street to Anderson Street for the installation of left turn lanes.

839 MOT **Webster Street**

Feasible: 2031-2035 Mileage: 0.50 Cost: $2.50 / $3.53 TIP: No

Widening of Webster Street to 5 lanes from Deeds Park Drive to Keowee Street for the installation of left turn lanes with parking and bicycle infrastructure.

844 MOT **County Line Road**

Feasible: 2021-2025 Mileage: 0.68 Cost: $4.34 / $4.34 TIP: Yes

Widening of County Line Road between Vale Drive and East Dorothy Lane. Roadway is currently a 3-lane section in this area and the proposed project will widen County Line Road to a 5-lane section, with 2 southbound lanes, 2 northbound lanes, and a center two-way-left-turn lane. Additional improvements include a traffic signal modification at the intersection with Tonawanda Trail, modified street lighting, and the construction of a 10-feet wide multi-use sidepath along the west side of the road.

856 MOT **Springfield Street**

Feasible: 2021-2025 Mileage: 1.47 Cost: $3.42 / $3.42 TIP: Yes

Roadway improvements to Springfield Street from Harshman Road to the City's east corporation line. Project consists of resurfacing, spot full depth repairs, catch basin replacements, replacement of existing barrier curb, traffic signal upgrades at two intersections, installation of new street lighting, and implementation of a road diet.

857A MOT **Valley Pike — Phase II**

Feasible: 2026-2030 Mileage: 0.36 Cost: $3.40 / $4.08 TIP: No

Reconstruct Valley Pike to an urban 3-lane section with combined curb and gutter, sidewalks, storm sewer system, and utility relocations from Broadmead Boulevard to 370' northeast of Pleasant Valley Avenue.

859 MOT **Dryden Road Multi-Modal Path — Phase I**

Feasible: 2031-2035 Mileage: 1.40 Cost: $0.75 / $1.06 TIP: No

Construct multimodal (bike, skate, walk) path along Dryden Road in front of former GM property to Northlawn Avenue to connect industrial property and West Moraine residential areas to the River Corridor bikepath.

860 MOT **Dryden Road Multi-Modal Path — Phase II**

Feasible: 2036-2040 Mileage: 1.40 Cost: $0.85 / $1.20 TIP: No

Construct multimodal (bike, skate, walk) path along Dryden Road from Arbor Boulevard to East River Road to loop through industrial areas and connect to the River Corridor bikepath.

865 MOT **East Third Street**

Feasible: 2036-2040 Mileage: 0.65 Cost: $5.75 / $8.11 TIP: No

Roadway narrowing on East Third Street from Keowee Street to Springfield Street to reduce travel lanes from 5/4 to 3.

866 MOT **Germantown Street**

Feasible: 2021-2025 Mileage: 0.78 Cost: $0.49 / $0.49 TIP: NF

Implement a road diet to reduce the through lanes from four lanes to two lanes with a double left turn lane and bike lanes on Germantown Street from Euclid Avenue to the Great Miami River Bridge.

867 MOT **Hudson Avenue / Main Street**

Feasible: 2026-2030 Mileage: 0.25 Cost: $1.50 / $1.80 TIP: No

Realignment of Hudson Avenue at Main Street to create a single intersection.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

868 MOT **Monument Avenue**

Feasible: 2026-2030 Mileage: 1.08 Cost: $4.10 / $4.92 TIP: No

Installation of a left turn lane on Monument Avenue from Keowee Street to Findlay Street.

869 MOT **Webster Street**

Feasible: 2026-2030 Mileage: 0.83 Cost: $4.10 / $4.92 TIP: No

Installation of a left turn lane on Webster Street from Keowee Street to Stanley Avenue.

870 MOT **West Third Street**

Feasible: 2036-2040 Mileage: 3.00 Cost: $5.00 / $7.05 TIP: No

Reduce lane configuration from 4 to 3 lanes along West Third Street from Broadway Street to Liscusm Drive.

872 MOT **Washington Church Road Extension**

Feasible: 2021-2025 Mileage: 0.63 Cost: $1.56 / $1.75 TIP: No

Construct new 2/3 land roadway approximately 3,300 feet south from intersection of Washington Church Road and Austin Boulevard to Montgomery/Warren County line.

875A MOT **Springfield Street**

Feasible: 2021-2025 Mileage: 0.77 Cost: $3.05 / $3.05 TIP: Yes

Resurface with curb, gutter, sidewalk, storm infrastructure, and lighting from Northcliff Drive to Woodman Drive. Include access management improvements and incorporate bike lane by changing cross section from 4 to 2 lanes with turn lane.

875B MOT **Springfield Street**

Feasible: 2026-2030 Mileage: 0.50 Cost: $3.85 / $4.62 TIP: No

Resurface with curb, gutter, sidewalk, storm infrastructure, and lighting from Smithville Road to Northcliff Drive. Include access management improvements and incorporate bike lane by changing cross section from 4 to 2 lanes with turn lane.

879A MOT **Woodman Drive Reconstruction — Phase I**

Feasible: 2026-2030 Mileage: 0.38 Cost: $4.50 / $5.40 TIP: No

Complete reconstruction of Woodman Drive between US 35 and Eastman including full-depth reconstruction, storm sewer replacement, traffic signal replacement, highway/decorative lighting and installation of sidewalk/bike path.

879B MOT **Woodman Drive Reconstruction — Phase II**

Feasible: 2031-2035 Mileage: 0.51 Cost: $5.20 / $7.33 TIP: No

Complete reconstruction of Woodman Drive between Eastman and Burkhardt including full-depth reconstruction, storm sewer replacement, installation of curb and gutter, lighting replacement, and installation of sidewalk/bike path.

879C MOT **Woodman Drive Reconstruction — Phase III**

Feasible: 2031-2035 Mileage: 0.72 Cost: $7.10 / $10.01 TIP: No

Complete reconstruction of Woodman Drive between Burkhardt and Airway including full-depth reconstruction, storm sewer replacement, curb and gutter, concrete median, new signal at Airway Shopping Center, access management, lighting replacement, and installation of sidewalk/bike path.

879D MOT **Woodman Drive Reconstruction — Phase IVA**

Feasible: 2026-2030 Mileage: 1.20 Cost: $4.50 / $5.40 TIP: No

Initial reconstruction of Woodman Drive between Airway and Springfield including R/W acquisition, storm sewer replacement, signal at Woodman and Springfield ramps, curb and gutter, and installation of sidewalk/bike path.

879E MOT **Woodman Drive Reconstruction — Phase IVB**

Feasible: 2026-2030 Mileage: 1.20 Cost: $9.20 / $11.04 TIP: No

Subsequent phase of reconstruction of Woodman Drive between Airway and Springfield including full-depth roadway reconstruction and highway/decorative lighting replacement.

880 MOT **Byers - Lyons Bikeway Connector**

Feasible: 2026-2030 Mileage: 0.50 Cost: $0.70 / $0.84 TIP: No

Construct a 10' ft wide shared used path linking existing shared use path at FedEx facility to existing shared use path on Lyons Road.

881 MOT **Patterson Boulevard Bridge**

Feasible: 2031-2035 Mileage: 0.15 Cost: $23.10 / $32.57 TIP: No

Replace structurally and functionally deficient 60-year old Patterson Boulevard bridge structure over Great Miami River, and provide sidewalks on both sides of the bridge to connect 225 ft gap in sidewalks.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

882 MOT **Alex-Bell Road**

Feasible: 2031-2035 Mileage: 0.50 Cost: $6.00 / $8.46 TIP: No

Reconstruct Alex-Bell Road from SR 741 to Lamme Road to include continuous sidewalk on both sides of road. Add two-way left turn lane between Cobblegate Drive and Lamme Road. Rehabilitate/reconstruct bridge located immediately east of Cobble Circle.

883 MOT **I-75 Auxiliary Lane**

Feasible: 2026-2030 Mileage: 1.00 Cost: $5.00 / $6.00 TIP: No

Construct an additional entrance ramp lane to southbound I-75 from I-675 to Austin Boulevard exit ramp.

884 MOT **I-75 Auxiliary Lane**

Feasible: 2026-2030 Mileage: 0.58 Cost: $7.00 / $8.40 TIP: No

Construct an additional entrance ramp lane to southbound I-75 from SR 725 to the I-675 exit ramp.

885 MOT **Dog Leg Road**

Feasible: 2026-2030 Mileage: 1.23 Cost: $4.80 / $5.76 TIP: No

Widen Dog leg Road from 9,500 feet east of Union Airpark Boulevard to Old Springfield Road from 2 to 3 lanes.

886 MOT **Old Springfield Road**

Feasible: 2026-2030 Mileage: 1.50 Cost: $7.00 / $8.40 TIP: No

Widen Old Springfield Road from 600 feet east of Union Airpark Boulevard to Peters Pike from 2 to 3 lanes.

887 MOT **Peters Pike**

Feasible: 2031-2035 Mileage: 0.70 Cost: $5.30 / $7.47 TIP: No

Widen Peters Pike from Old Springfield Road to North County Line Road from 2 to 3 lanes. Re-align North County Line and Lightner Road at intersection with Peters Pike.

888 MOT **Old Troy Pike**

Feasible: 2026-2030 Mileage: 0.40 Cost: $1.00 / $1.20 TIP: No

Widen Old Troy Pike by adding an additional northbound lane between Taylorsville Road and the ramp to I-70 eastbound on the south side of the overpass bridge.

889 MOT **Monument Avenue Street Conversion**

Feasible: 2026-2030 Mileage: 0.50 Cost: $0.50 / $0.60 TIP: No

Convert one way street to two way with removal of the signals at St. Clair Street, Jefferson Street, Ludlow Street, and Wilkinson Street and replacement with all-way stop signs.

890 MOT **Keowee Street**

Feasible: 2031-2035 Mileage: 0.75 Cost: $4.00 / $5.64 TIP: No

Reconstruct Keowee Street from US 35 to East First Street with a change of the lane configuration from 6/7 lanes to 5 lanes.

891 MOT **James H. McGee Boulevard Extension**

Feasible: 2031-2035 Mileage: 0.20 Cost: $1.50 / $2.12 TIP: No

Extend James H. McGee Boulevard as a 5 lane section through the Desota Bass property to connect with Danner Avenue at W. Stewart Street.

892 MOT **Findlay Street**

Feasible: 2031-2035 Mileage: 0.40 Cost: $2.00 / $2.82 TIP: No

Reconstruct Findlay Street from E. First Street to Monument Avenue with a reconfiguration to a 3 lane section with bike lanes or bike path.

893 MOT **Edwin C. Moses Boulevard and West Riverview Road**

Feasible: 2026-2030 Mileage: 0.50 Cost: $0.50 / $0.60 TIP: No

Implement road diet on Riverview Avenue and Edwin C. Moses Boulevard from Monument Avenue to West Third Street from 5/4 lanes to 2/3 lanes with parking, and realign the intersection of Edwin C. Moses Boulevard and West Riverview Avenue.

710D WAR **SR 73 / I-75 — Phase IV**

Feasible: 2031-2035 Mileage: 1.08 Cost: $1.35 / $1.90 TIP: No

Reconstruct Ramp D as a two-lane exit ramp from SR 73 south until the proposed edge of pavement intersects with existing I-75 edge of pavement and the Ramp E loop entrance ramp from SR 73 to the existing ramp pavement at the I-75 bridge; including a new traffic signal at the intersection of Ramp D and SR 73.

Table 5.3 — Proposed Congestion Management Projects
(Cost is in Millions of 2020 / Year of Expenditure Dollars)

715 WAR **Clearcreek Franklin Road**

Feasible: 2031-2035 Mileage: 0.70 Cost: $1.35 / $1.90 TIP: No

Widen from 2 to 3 lanes from Whispering Pines to Pennyroyal Road adding curb and gutters and storm sewers. Re-profile roadway to correct vertical deficiencies and re-stripe roadway to include bike lanes.

716 WAR **Traffic Signal System Interconnect**

Feasible: 2031-2035 Mileage: N/A Cost: $1.75 / $2.47 TIP: No

Interconnect the traffic signals in the City of Franklin with the City's Central Controlled Signal System including the installation of either fiber or radio interconnect to each of the signals. The project would also update the outdated cabinets and controller equipment to advanced traffic control equipment (ATC) and NTCIP compliant to communicate to the City's Central Controlled signal system.

717 WAR **SR 73 Improvement Project**

Feasible: 2046-2050 Mileage: 1.90 Cost: $3.75 / $6.64 TIP: No

Install curb and gutter, sidewalks, embankment, storm sewer pipe extension, catch basins, signal upgrades and a pedestrian bridge along SR 73 from Springwood Lane to Deardoff Road.

718 WAR **SR 123 Improvements**

Feasible: 2046-2050 Mileage: 1.14 Cost: $4.30 / $7.61 TIP: No

Widen SR 123 from 2 to 3 lanes including installation of a 4' treated shoulder from Beal Road to Robinson Vail Road, correct vertical alignment and add storm sewers as needed.

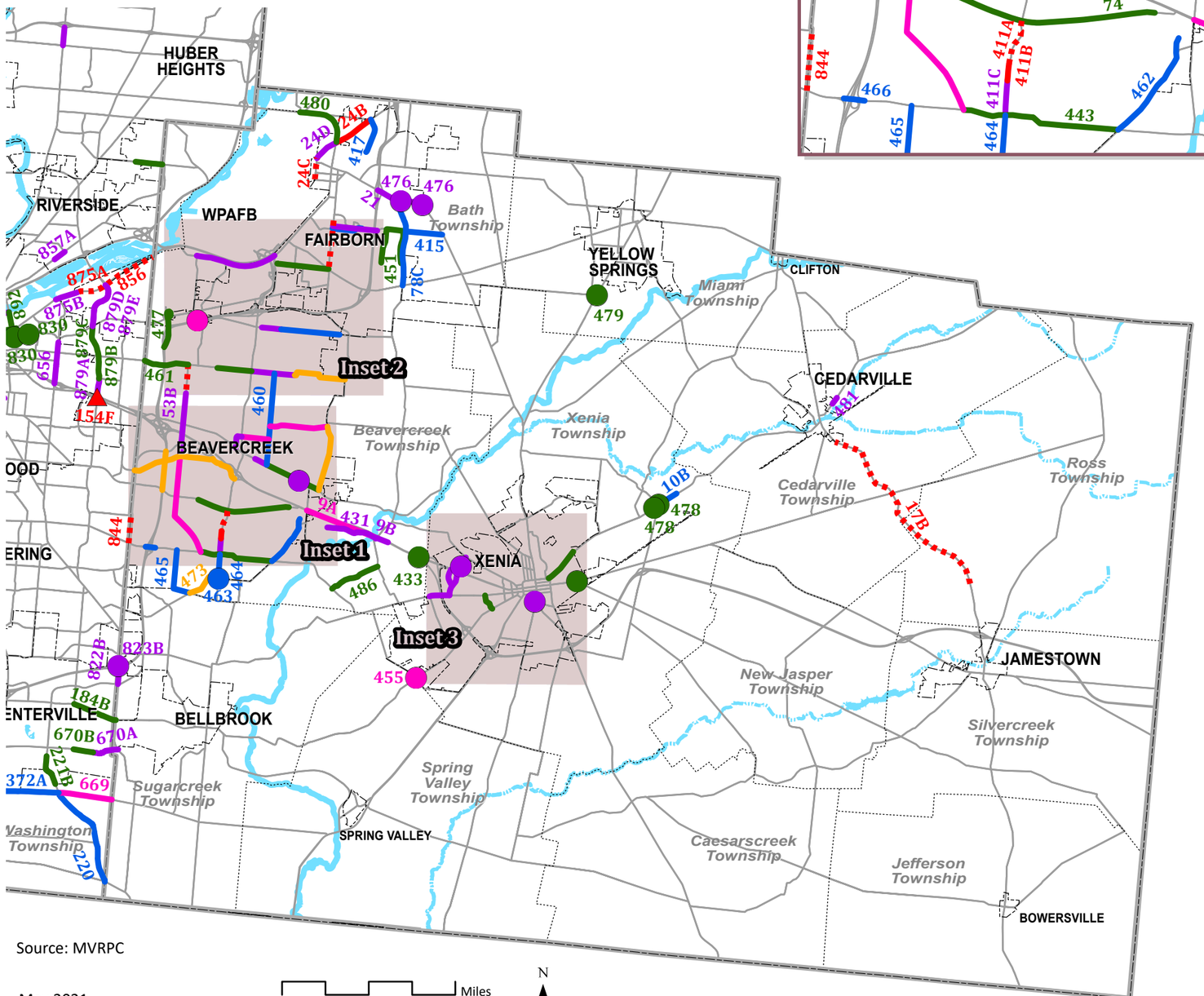
719 WAR **SR 123 Improvements**

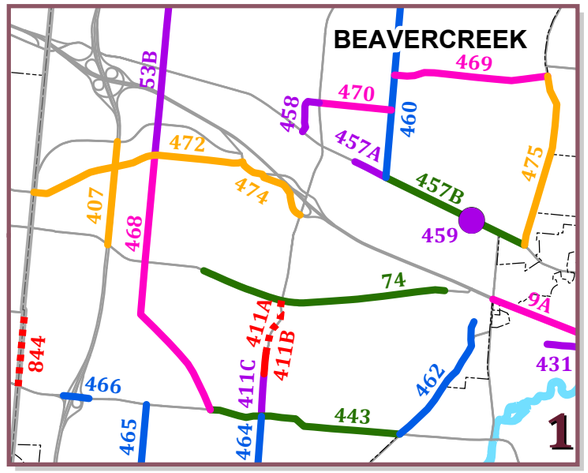
Feasible: 2036-2040 Mileage: 1.14 Cost: $5.20 / $7.33 TIP: No

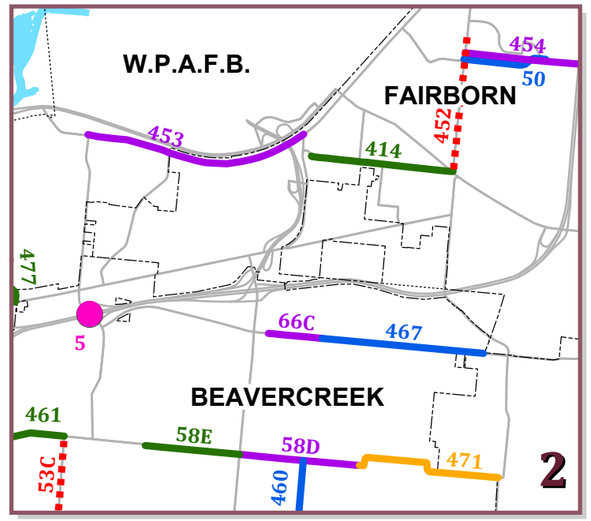
Widen SR 123 from 2 to 3 lanes including installation of a 4' treated shoulder from Riley Boulevard to I-75, realign and install traffic signal at the intersection of Grand Oak Drive and Watkins Glen Drive, and upgrade all existing traffic signals.

Source: MVRPC

Figure 5.3
Congestion Management Projects:
Greene County







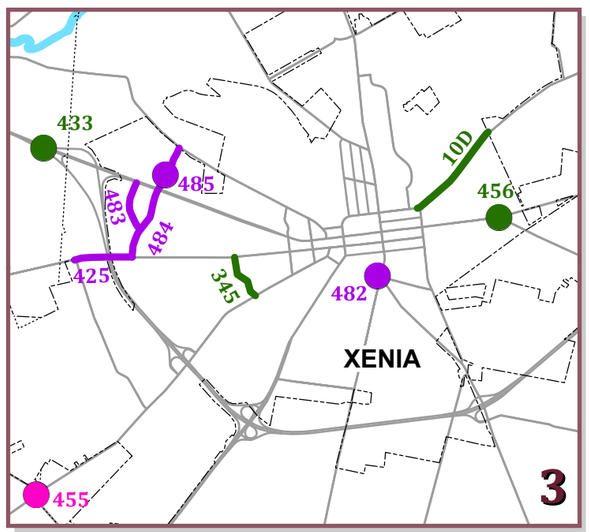
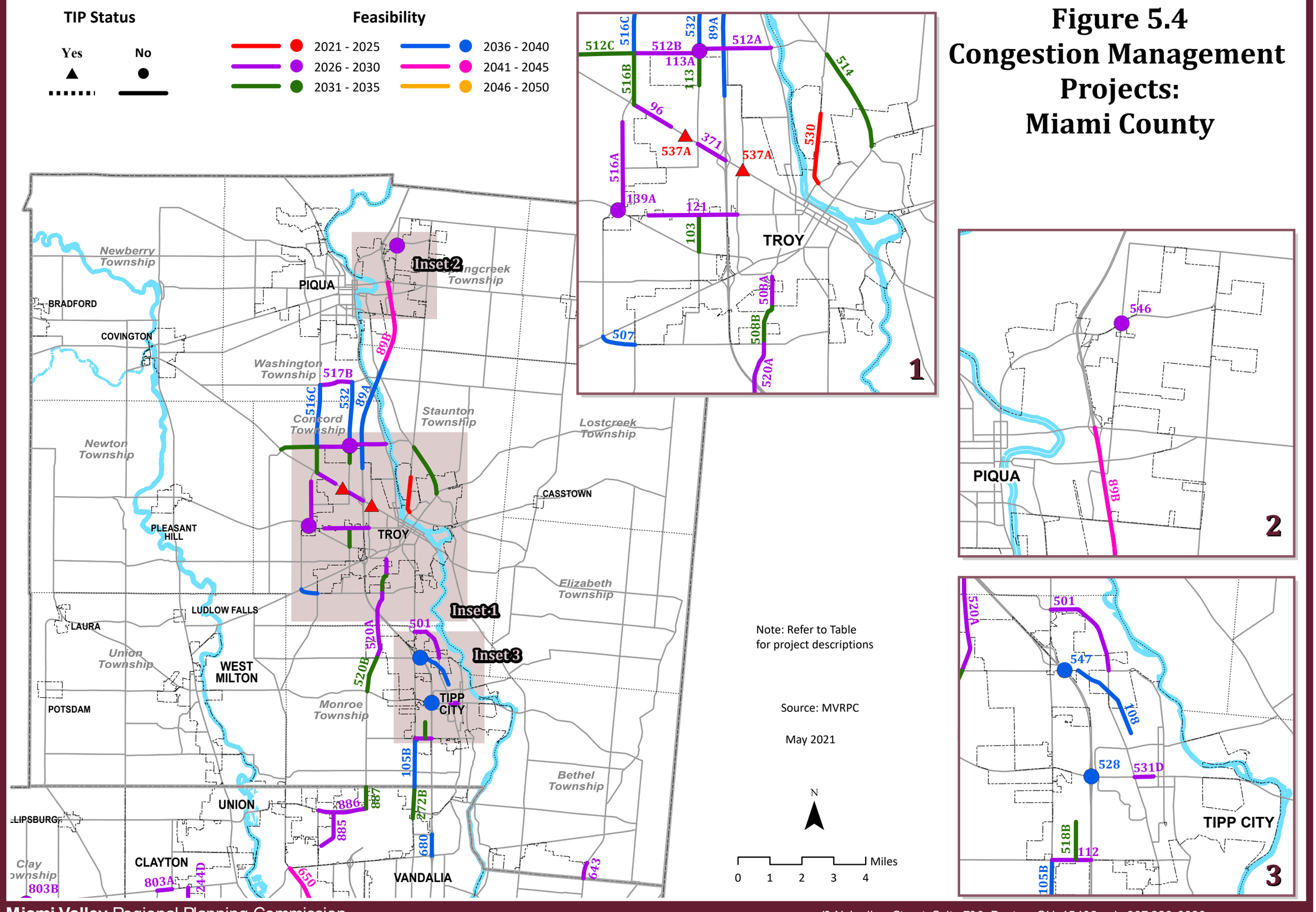
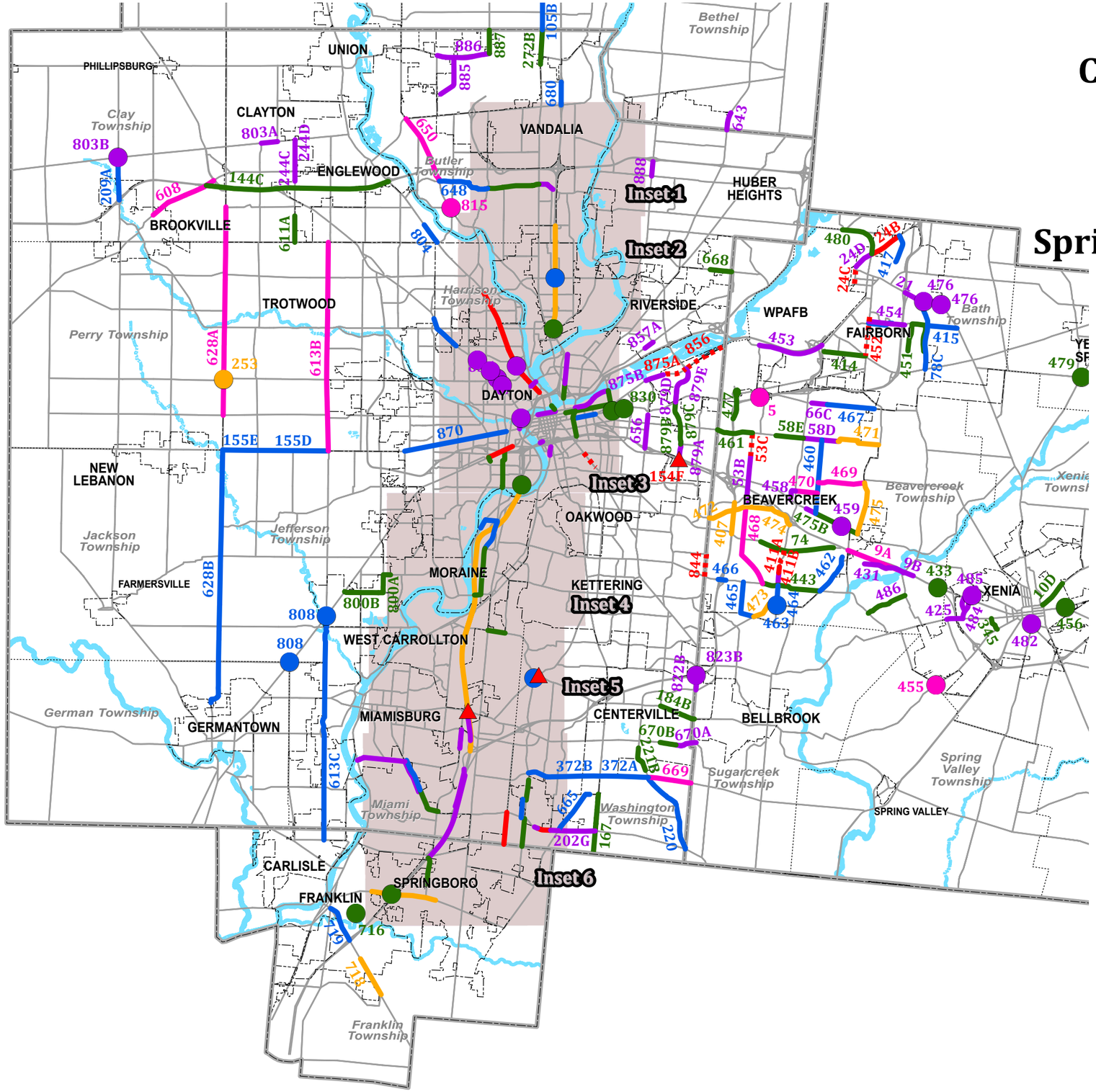


Figure 5.4
Congestion Management Projects:
Miami County



MVRPC

Figure 5.5
Congestion Management Projects:
Montgomery County, Carlisle, Franklin, Springboro, and Franklin Twp.



TIP Status

Yes ▲ ..... No ●

Feasibility

- 2021 - 2025
- 2026 - 2030
- 2031 - 2035
- 2036 - 2040
- 2041 - 2045
- 2046 - 2050

Note: Refer to Table for project descriptions.

Source: MVRPC

May 2021

0 1.5 3 4.5 6 Miles

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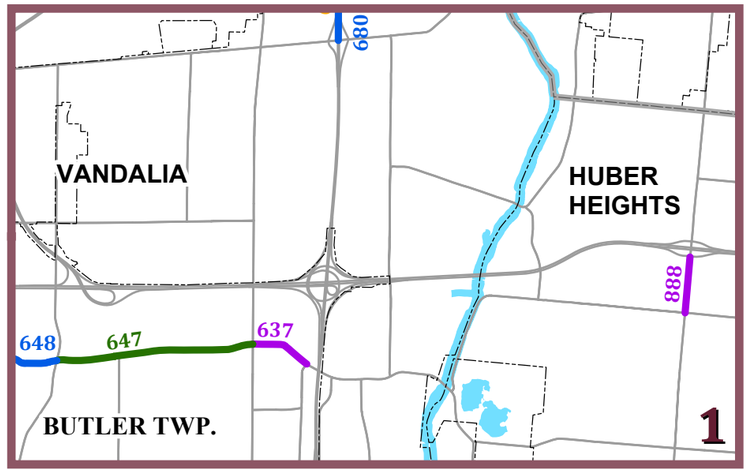
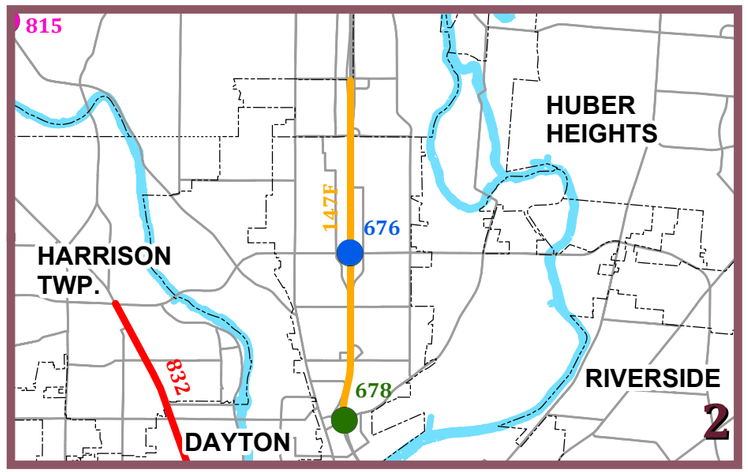
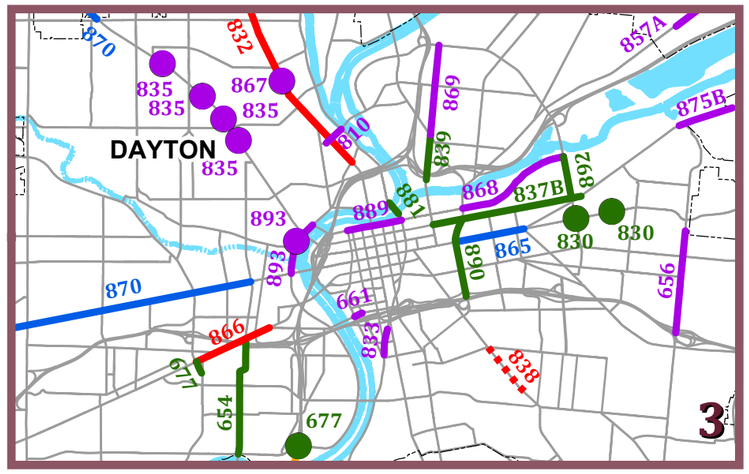
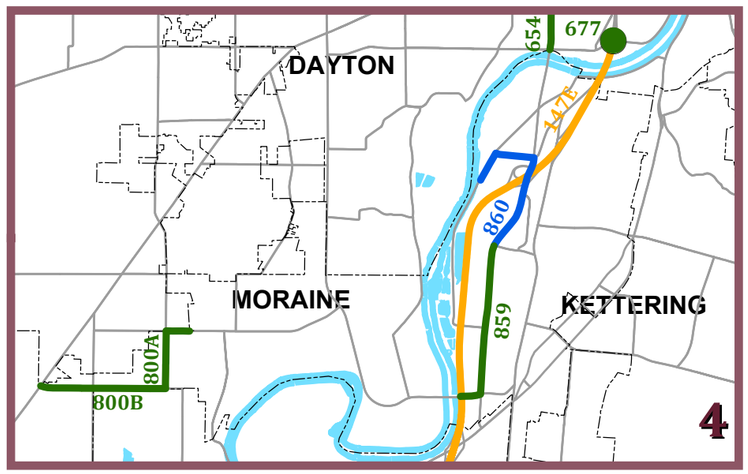
MVRPC

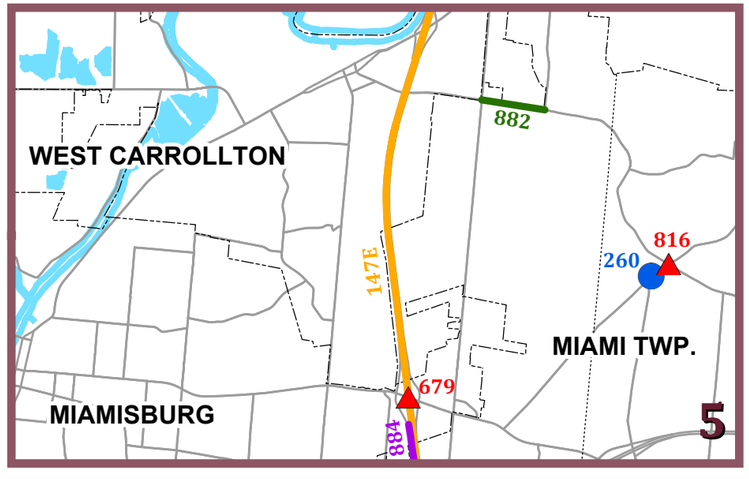
Figure 5.6
Congestion Management Projects: Montgomery County Insets

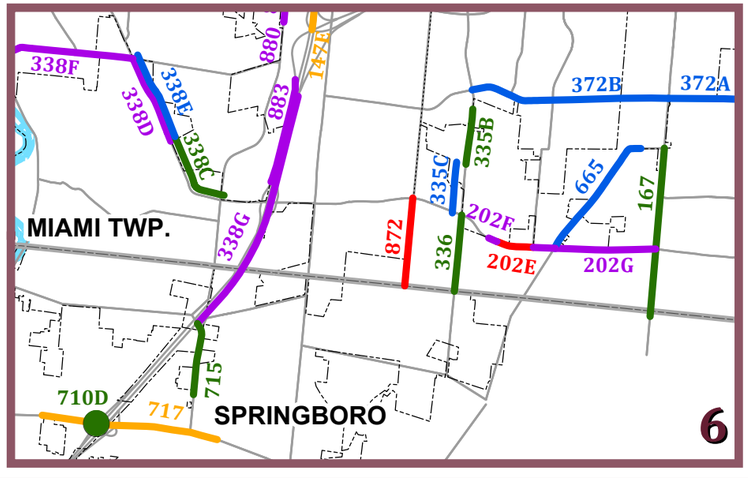












TIP Status

Yes ▲ ..... No ●

Feasibility

2021 - 2025	2036 - 2040
2026 - 2030	2041 - 2045
2031 - 2035	2046 - 2050

Note: Refer to Table for project descriptions.

Source: MVRPC

May 2021

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CHAPTER 6

CONGESTION MANAGEMENT STRATEGIES – TRANSIT

6.1 Overview

For the Region to progress, it must have a comprehensive transportation system that serves the needs of travelers using all modes of transportation with reasonable mobility options for all residents including those using public and human services transportation. The 2050 Long Range Transportation Plan addresses future mobility needs by including transit programs and projects that provide alternatives to the private automobile.

Four transit agencies serve the Region (see Figure 6.1). The Greater Dayton Regional Transit Authority (GDRTA) provides fixed-route service in Montgomery County. The Greene County Transit Board (Greene CATS Public Transit) provides flex-route service as well as demand-responsive service in Greene County. The Miami County Transit System and the Warren County Transit System provide demand-responsive service in Miami and Warren counties, respectively.

As part of the 2000 Census, the Dayton Urbanized Area boundary was redrawn, resulting in the reclassification of the transit systems in Miami County and Greene County from rural to urban systems. This means that the rural program funding source will no longer be available for the newly designated urban transit systems and that funding for these transit systems will now come from the Federal Transit Administration's (5307) Bus Tier Urban Transit Funding.

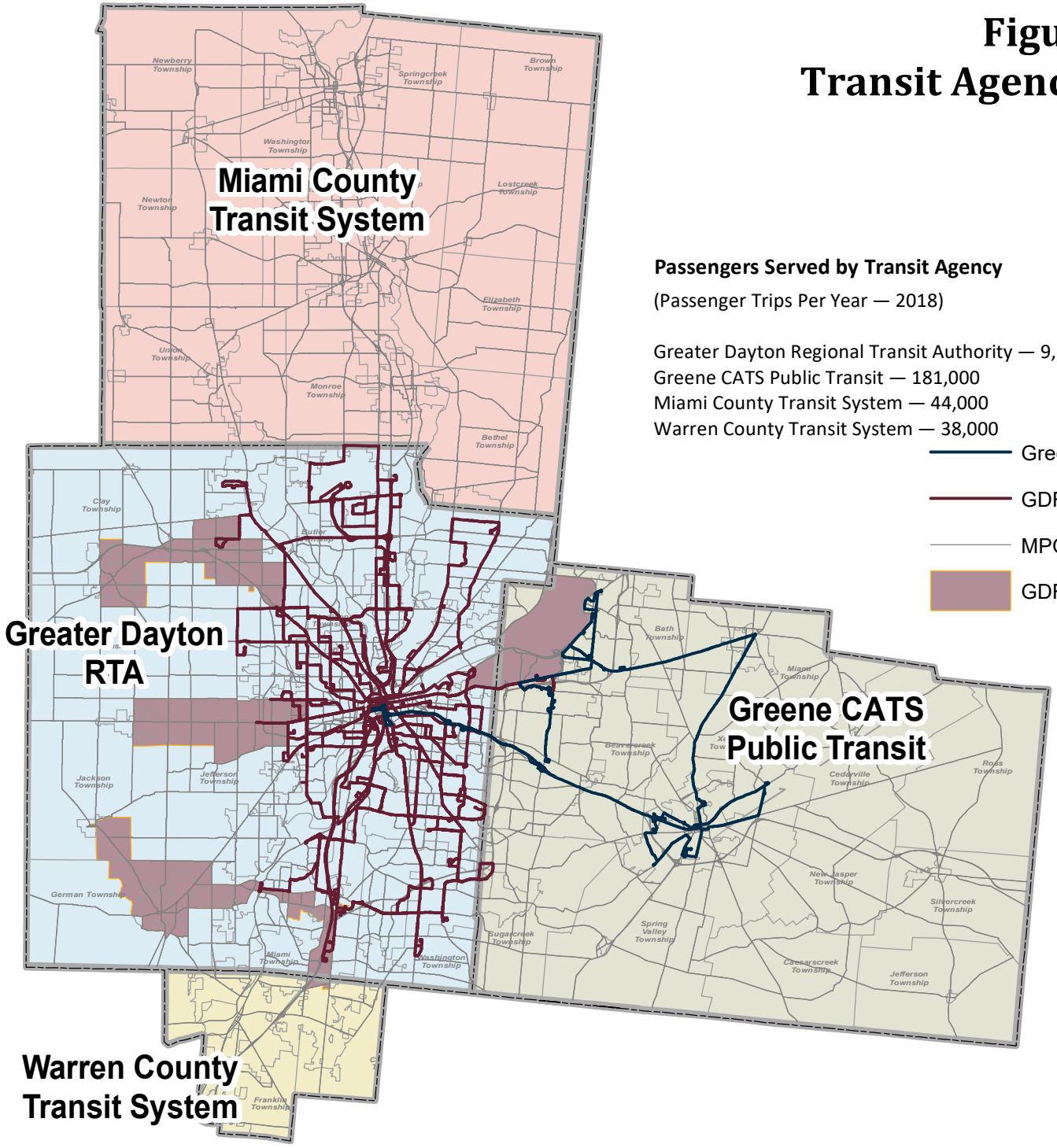
In December of 2002, ODOT asked MVRPC to play a lead role in crafting a funding agreement to suballocate the FTA's 5307 funding between the urban transit operators annually. At ODOT's request, MVRPC formed a sub-committee consisting of officials from RTA, the Greene County Board of Commissioners, and the Miami County Commission. The funding agreement has been approved and signed by all three organizations/entities, and is administered by MVRPC annually. MVRPC and the transit agencies are currently developing a process to allocate FTA's 5339 funding.

Financial Outlook

Financial forecasts for the regional transit agencies were provided by each agency in year of expenditure dollars for the same periods, using the, FY 2020, U.S. Office of Management and Budget, U.S. Budget Economic Assumptions for Consumer Price Index for FY 2030 (2.3 percent per year) to project inflation into the future. The analysis shows that the various transit programs are fiscally constrained throughout the life of the Plan and the complete financial analysis can be found in the LRTP Financial Summary Report.

MVRPC

Figure 6.1
Transit Agency Service Areas



Passengers Served by Transit Agency

(Passenger Trips Per Year — 2018)

Greater Dayton Regional Transit Authority — 9,129,000
Greene CATS Public Transit — 181,000
Miami County Transit System — 44,000
Warren County Transit System — 38,000

Greene CATS Flex Routes
GDRTA Fixed Transit Routes
MPOnet2015
GDRTA Connect Zones

Source: GDRTA, Greene CATS, MCTS, and WCTS

May 2021

N

0 2 4 6 8 Miles

6.2 Greater Dayton Regional Transit Authority

The long range planning process used by RTA is based upon strategic plan priorities, as well as federal directives. This planning process has led to the current transit system and has also assisted in the development of the 2050 LRTP.

Service Description and Social/Economic Impacts

RTA provides approximately 9 million passenger-trips per year through an extensive network of fixed routes, covering nearly 1,000 miles of directional roadways. Further, RTA's Transit Centers, located throughout Montgomery County, connect the central city and the suburban areas with bus services at centralized locations.

Fixed Route Service

GDRTA serves Montgomery County and Wright Patterson Air Force Base (WPAFB), Wright State University (WSU), Fairfield Commons Mall, and Soin Medical Center in western Greene County through a network of 28 bus routes. There are 10 local routes that provide downtown-based service, mostly within the City of Dayton; 6 suburban routes that provide downtown-based service for 18 suburban jurisdictions; 3 cross-town routes that provide service between nine jurisdictions; 3 express routes serving five jurisdictions, with service to downtown; 3 feeder routes that provide intra-neighborhood service within 4 jurisdictions; and 3 Senior Mobility routes.

Demand Response Service

Beginning in 2016, RTA created a new line of alternative mobility services called Connect. RTA Connect is intended to give customers one-stop access to the mobility option that best meets their needs. The Connect line of services include Americans with Disabilities Act (ADA) - Complementary Paratransit, County-Wide Paratransit, Same Day Paratransit, On-Demand, Premium, Link bike share, and various coordinated demand response services.

Connect Paratransit service offers door-to-door service to certified customers with disabilities who are unable to use fixed routes. This includes complementary ADA, county-wide and same day paratransit services. Countywide service launched in 2016, providing expanding access to all eligible customers outside the standard ADA ¾ mile service area to throughout Montgomery County. Same day service launched in 2018, providing an opportunity for all ADA eligible customers to travel same day as availability allows. Same day service provides the customers with more flexibility and the ability to work around critical medical appointments that may not run on time.

Connect On-Demand service launched in June 2017, creating the state of Ohio's first partnership between a public transit agency and ride-sourcing companies. On-Demand enhances and increases accessibility in previously underserved areas, and is designed and structured to complement existing RTA services. As of 2020, over 80% of On-Demand trips connect to RTA fixed route services. On-Demand (first and last mile) is offered within certain areas where fixed-route service is either unavailable or limited. There are five (5) On-Demand zones/areas throughout Montgomery and parts of western Greene counties. RTA and other transportation providers, including taxi and ride-sourcing companies provide the service.

Connect Premium Service is a door-to-door service that is open to the general public and serves Greene, Miami, Montgomery, Preble, and Darke Counties and northern Warren County. The cost of a one-way trip is applied to the reserving customer and includes traveling companions who board and alight at the same locations as said customer.

Bike Share

Within the City of Dayton, located in Montgomery County, established bike share system, Link allows for travelers to more easily make their first or last mile connections to other modes of mobility. Link is a mobility system designed for short trips that encourages service sharing. The Link Dayton Bike Share program has a fleet of 225 pedal bikes, and 100 e-bikes. Link is a service administered by Bike Miami Valley and operated by RTA.

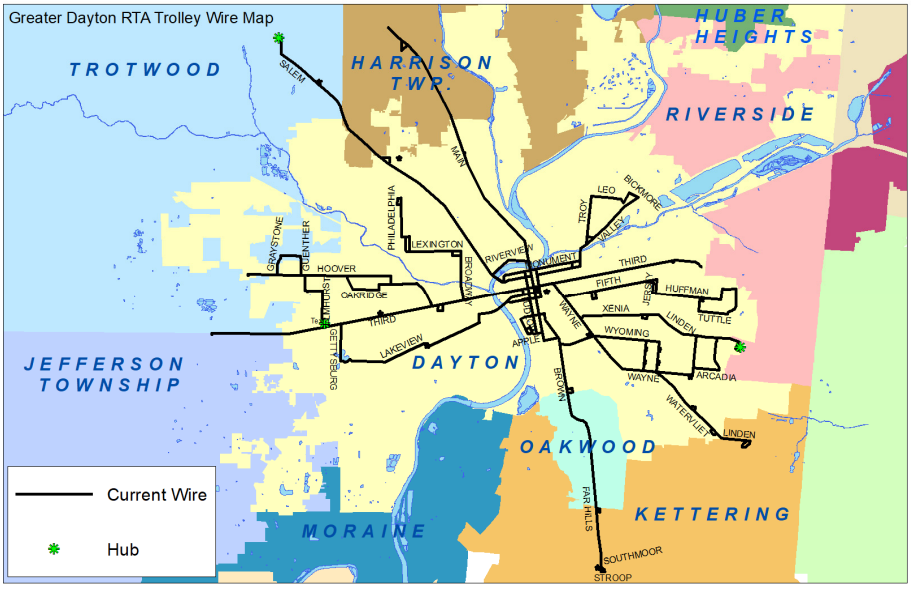
The Social, Environmental, and Economic Benefits of GDRTA's Service

About 65% of riders use the RTA to get to jobs, 15% to medical appointments, 10% to educational opportunities, and remaining customers utilize RTA for shopping/social purpose trips. This creates an economic engine for the community and results in $4 of economic return for every $1 invested in public transportation.

To benefit the community, the RTA has invested in environmentally friendly technology using dual-mode electric trolley and hybrid diesel vehicles. RTA operates a fleet of 45 NexGen trolley buses, which run on RTA's 123 miles of trolley wire infrastructure, including off-wire, expanding the overall coverage of the trolley network. In 2010, RTA was designated the highest possible certification as a five-star Ohio Green Fleet by Clean Fuels Ohio.

Electric Trolleybus Service

RTA is committed to clean air methods of transportation with its electric trolleybuses. Fifty-seven electric trolleybuses were purchased from 1996 through 1998 as a replacement of the old electric fleet. In 2010, RTA conducted a cost/benefit analysis which recommended continued operation of trolley buses along with community support from those benefiting communities.



As a result, beginning in 2018, RTA began replacing its older fleet of trolley buses and as of 2020, operates a fleet of NexGen trolley buses. NexGen buses run on RTA's 123 miles of trolley wire infrastructure, including off-wire operation, expanding the overall trolley bus network. The NexGen's battery propulsion system can power a fully loaded bus at full speed for 15 miles off wire. The NexGen bus has a lifespan of 18 to 20 years and 500,000 miles. It costs more than a standard diesel bus but lasts longer, provides lower operating costs, is better for the environment and quieter.

Technology

In 2013, RTA began planning and implementing numerous technologies in support of improving mobility operations and the experiences of its users. Transit technologies focus on increasing efficiencies, enhancing operational effectiveness, increasing service usage and satisfaction, increasing safety and security, and improving financial and performance management.

Intelligent Transportation Systems — Intelligent Transportation Systems (ITS) are essential components of the day-to-day operations infrastructure of RTA and other public transit agencies. Together these systems perform mission critical functions necessary to deliver safe and efficient services to RTA customers and employees. RTA recognizes the importance of providing and supporting a state-of-the-art system to maintain a safe and reliable service to its customer, employees and the community.

RTA's system currently provides enhanced performance, productivity and efficiency, and advanced resource management capabilities that improves capacity to deliver consistent and quality service. In addition to maintaining and enhancing the key role of ITS as a source of real-time data that is used to support RTA's operations, planning, customer service, security, and revenue collection functions.

Real Time Information System — RTA's real time information system, created by its ITS infrastructure, provides customers with real time bus arrival information, including notification of service changes in real time. The Transit app is a trip planning and real-time tracker tool for customers to use to plan their trip and know when their bus will be arriving to their stop. This platform was rolled out to RTA customers in 2016 and is currently the preferred method of bus tracking and trip planning.

In addition, RTA released a text and email alert subscription program for its customers, an interactive voice response system to provide automated real time service information via RTA's phone system, and a text for next bus feature where customers can text the RTA their bus stop number and receive a message back when the next buses are arriving in real time to that stop.

Radio and Data Systems — In 2016, RTA replaced its radio and data system with a 800 MHz voice and cellular data communications system. This state of the art communications system now provides increased coverage beyond RTA's current service area, redundancy (backup), increased communication capabilities with first responders increasing customer safety and security leading to an overall secure and reliable communications network within RTA's service area

On Board Camera Surveillance System — In 2016, RTA replaced its camera system to provide increased safety and security. The current on-board camera system is available on all RTA fixed route and demand

response services and provides state of the art advanced video and audio quality along with the ability to conduct real time live streaming of any on-board camera in the event of an emergency.

The Future Service

As the region changes so must RTA services to continue connecting people to jobs, healthcare and educational opportunities. In addition, while RTA assets are in good condition, continued investment in state of good repair at facilities, in fleet replacement and the needed rebuild of the trolleybus infrastructure will still require a funding stream to match federal and state investments.

Transit Network Redesign — Beginning in 2016, the RTA embarked on a comprehensive transit network redesign project called What Drives You. RTA finalized the project in 2020. The goal of the project was to develop service plans that increase the quality of RTA services, through more frequent, direct and easy to use range of multi-mobility options. The following guiding principles were utilized to help shape the overall mobility network recommended:

- Customer, Community & Employee Focused
- Equitable & Accessible
- Connections to Jobs, Healthcare & Educational Opportunities
- Data Driven

During the project, RTA targeted and studied promising transit markets (e.g. employment centers, daycare facilities, universities, etc.) and identified traditional and non-traditional transit options to encourage and increase existing and new ridership. Transportation coordination efforts between various agencies will always be a priority to RTA.

Technology Systems — RTA's future technology investments will focus on the goal of providing universal mobility access to the region through one mobile application or phone call to the RTA. Through the implementation of an advanced payment and mobility-as-a-service (MaaS) system, RTA can achieve this goal.

In 2020, in order to provide high quality, accessible services to its customers, RTA began replacing its existing fare payment solution. The new payments solution will be an integral part of the MaaS platform, which is capable of not only serving RTA but also the Greater Dayton region, which may span a minimum of 9 counties.

RTA's new payment system, which is slated to be fully implemented in 2020/2021, will be flexible in order to accommodate other mobility modes for the provision of MaaS. RTA and its technology partners goal is to provide seamless trip planning and payment together within one mobile application, ensuring 100% end-to-end multi-mode connectivity for all customers. Customers will be provided an easy-to-use, open sourced and integrated payment platform, connecting along various mobility modes. The system will also provide benefits that include system cost reductions, a more streamlined operating process, greater customer satisfaction and operational efficiencies.

In 2018, RTA implemented fare structure changes. As a result, customer pass usage went from 55% to 80%, while decreasing cash and coin usage from 30% to 10%. While the fare structure changes were driven

primarily by budget constraints, the redesigned structure kept focus on RTA's goal of eliminating cash on-board vehicles and increasing more advanced payment methods, such as contactless smartphones and smartcards.

GDRTA Assumptions for 2021 – 2050

The following assumptions were made in developing the RTA Long Range Transportation Plan project lists, costs, and revenues:

Fiscal Constraint — RTA Long Range Transportation Plan project list is fiscally constrained and was even further constrained due to the impact of the 2020 COVID-19 pandemic.

Service and Ridership — Service area is likely to remain the same, however funding constraints could result in service alterations or reductions. In 2019, RTA experienced a ridership increase of 5%, but due to the impact of the 2020 COVID-19 pandemic, ridership is likely to decline.

Service Configuration

- Service area is likely to remain the same, however funding constraints could result in service alterations or reductions.
- RTA will continue to operate as a multiple transit center/transfer system.
- RTA will pursue dual-mode vehicle technology for service extensions off existing electric trolley wire.
- RTA is in compliance with ADA and will continue to work with human services transportation coordination efforts.
- Annual vehicle hours and vehicle miles will slightly decrease.
- Annual ridership will slightly increase
- Average fare will slightly increase.

Fleet Changes — RTA anticipates a fleet size as follows:

- Electric Trolleys – 45;
- Diesels 30' to 40' – 120;
- Small Connect Vehicles – 75; and
- Contingency 35' to 40' Diesels – remain at 20.

Capital Needs — Fleet Replacement

- Electric trolley buses will be replaced every 18-20 years
- Diesel buses will be replaced every 10-12 years
- Demand response vehicles will be replaced every 5-7 years

Electric TrolleyBus Infrastructure — Continued maintenance of substation and overhead distribution system.

Other

- Utility vehicle fleet to be replaced several times over the 2021-2050 period;
- Vehicle equipment;
- Upgrades to our facilities and hubs;

- Office/shop equipment;
- Capitalized leases;
- Planning projects; and
- Community projects.

Project List, Cost, and Revenues

A summary of GDRTA's Long Range project list is presented in Table 6.1.

Table 6.1 — GDRTA 2050 LRTP Projects
(in millions of Year of Expenditure dollars)

Project	Cost
Capital Projects	***685.15***
Revenue Vehicles & Equipment	
- Electric Buses - 45 (Fleet of 45)	95.10
- Diesel Buses - 313 (Fleet of 120)	230.83
- Small Connect Buses- 375 (Fleet of 75)	52.77
- Vehicle Equipment	2.12
Electric System Infrastructure	119.78
Transit Hubs & Facility Improvements	
- Longworth Campus	40.94
- Downtown Campus	24.15
- Countywide Transit Hubs	21.06
- Facility-wide Security Items	14.63
Equipment	
- Maintenance Equipment	13.77
- Office Equipment & Furnishings	7.49
- Computer Equipment & Software	25.53
- Support / Utility Vehicles	3.19
Passenger Amenities	
- General Transit Enhancements	10.56
- Community Specific TE Projects	8.29
Capital Tire Lease	16.94
Operating / Maintenance Projects	***2,903.25***
Total	***3,588.40***

Source: GDRTA

6.3 Greene County Transit Board (Greene CATS Public Transit)

The Greene County Transit Board is a public body that was formed to provide public transit for Greene County and to help coordinate social services transportation in the County. The commonly known name of the transit service is "Greene CATS". The Board contracts out the day-to-day operations of the transit service to a private company, currently First Transit.

Service Description

The system is a combination of traditional demand responsive service and flex routes. Flex routes have defined routes with scheduled time points that circulate and link the larger Greene County communities and connect with Greater Dayton RTA service, operating seven days a week. The service is wheelchair accessible and serves a mix of fare-paying and contract riders. The transit service area is Greene County with trips to neighboring counties on a limited basis. In addition, the Greene County Transit Board works with local social services agencies through its Mobility Management Program to help coordinate social service transportation and provide a wider range of transportation options to riders.

Plan Assumptions

The following assumptions were made in developing the Greene CATS Public Transit project lists, expenses, and revenues for the 2050 LRTP:

- Cares Act Funding;
- Increased Ohio of Department of Transportation formula funding
- Reduction in FTA funding due to reduction in total annual trips provided from reduction of Developmentally Disabled service
- Reduction in FTA funding as startup grant for expanded service on Flex Routes runs out
- Reduction in contract and fare revenue due to coronavirus pandemic
- No change in fares through 2021
- No dedicated source of local revenue
- Reduced peak, evening, and weekend flex route service beginning in 2021
- Continue to provide contract service for local social service agencies; and
- Continue Mobility Management Program.

Table 6.2 — Greene CATS Public Transit 2050 LRTP Operating Statistics

	Short Term I Plan 5 years (2021-2025)	Short Term II Plan 5 years (2026-2030)	Long Term Plan I 10 years (2031-2040)	Long Term Plan II 10 years (2041-2050)	Full 30 Year Plan
Vehicle-miles: (945,000/yr)	4,725,000	4,725,000	9,450,000	9,450,000	**28,350,000**
Vehicle-hours: (54,000/yr)	270,000	270,000	540,000	540,000	**1,620,000**
Fleet size:	45	45	45	45	-
Passenger trips: (120,000/yr)	600,000	600,000	1,200,000	1,200,000	**3,600,000**

Source: Greene CATS Public Transit

Project List, Cost, and Revenues

A summary of the Greene CATS Public Transit 2050 LRTP project list is presented in Table 6.3.

Table 6.3 — Greene CATS Public Transit 2050 LRTP Expenses Summary (in millions of 2020 / Year of Expenditure dollars)

Major Projects	Cost
Capital	***7.68***
- Bus Purchase – 150 (Fleet of 45)	6.44
- Shop/Office Equipment	1.24
Operating / Maintenance	***81.66***
Total (2020 dollars)	**89.34**
Total (YOE dollars)	**127.83**

Source: Greene CATS Public Transit

6.4 Miami County Transit System

As a result of the 2000 Census classifying Miami County as an urbanized area, the Board of Commissioners established a Miami County Transit Department effective January 2, 2004. The Miami County Transit staff is responsible for the growth, financial, and operational aspects of the department. Operations and Maintenance are currently contracted to First Transit.

Service Description

Miami County Transit System provides demand responsive transit services within the geographic area of Miami County. The service area was expanded in January 2007 to include the City of Piqua, which operated a rural transit system through 2006. Funding for the rural transit system in the City of Piqua was eliminated effective January 1, 2007, at which time the merger of the Piqua Transit Service and the Miami County Transit System concluded.

Miami County Transit offers a connection with GDRTA in two areas (one on Route 17 Vandalia and one on Route 18 Huber Heights). There are also two other connections with Darke County and Shelby County that work with Greenville Transit System (Darke County) and Shelby County Public Transit (Shelby County), respectively. Miami County Transit provides service six days a week, Monday through Friday from 5:00 AM to 6:00 PM, and Saturday from 8:00 AM to 2:00 PM.

The County anticipates continued increases in benefits for local human service organizations. Many of these organizations have the opportunity to utilize Miami County Transit as a method of expanding existing programs. The County also anticipates continued population growth. With this being said Miami County Transit may look into the option of a Flex Route, if funds are available to sustain the need.

In limited cases, special transit trips may have trip ends (such as major employers, medical facilities, etc.) outside of Miami County, but within ODOT's 50-mile radius constraint. The system provides approximately 62,300 trips annually. Annual increases in passenger counts are expected. These increases will require a thoughtful approach in order to absorb new riders into the existing infrastructure of the system and operate within available resources. The current fleet consists of eighteen small transit buses, all are lift equipped and ADA accessible.

Project List, Cost, and Revenues

A summary of the Miami County Transit System's 2050 LRTP project list is presented in Table 6.4 below.

Table 6.4 — Miami County Transit 2050 LRTP Projects (in millions of Year of Expenditure dollars)

Project	Cost (YOE)
Capital	***9.57***
- Small Buses - 90 (Fleet of 18)	9.25
- Shop/Office Equipment	0.11
- Security Equipment	0.21
Operating / Maintenance	***55.63***
Total	**65.20**

Source: Miami County Transit

6.5 Public Transit Human Services Transportation

Coordinated Public Transit-Human Services Transportation Plan

SAFETEA-LU required that proposed projects under three FTA formula programs (the Specialized Needs of Elderly Individuals and Individuals with Disabilities Program — Section 5310, Job Access and Reverse Commute — Section 5316, and the New Freedom — Section 5317) be included in a locally developed coordinated public transit/human services transportation plan. MAP-21/FAST Act has maintained the coordinated planning requirement, but has changed specific programs governed by that requirement. Specifically, Section 5316 (New Freedom) funding was combined with Section 5310 to create a revamped program now called Enhanced Mobility of Seniors and Individuals with Disabilities Program. The Section 5316 program (Job Access and Reverse Commute or JARC) ended and the funding was redirected to regional transit agencies to enhance transit services for job access. The Coordinated Plan must be developed and managed through a process that includes representatives of public, private, non-profit transportation, and human services providers, as well as the public including non-drivers, people with disabilities, and the elderly.

Miami Valley Coordinated Transportation Plan

In the Dayton urbanized area, MVRPC, in cooperation with transportation providers in Greene, Miami, and Montgomery counties, took the lead in developing the Coordinated Public Transit Human Services Transportation Plan which was endorsed by the MVRPC Board of Directors in April 2008. Summaries of the Plan findings and recommendations are included below with the recommendations listed in order of priority. In 2012 and again in 2019, the HSTC plan was updated documenting progress of the initial findings and identifying new focus areas. Many of these findings remain true in 2021, largely due to underlying demographic trends, such as the aging of the area's population and the related increase in people with disabilities. In addition, lack of local funding to expand transportation services for older adults and individuals with disabilities has been an impediment to making significant progress on many issues.

Findings from the 2008 Coordination Plan

- Need for better public transit connections across county boundaries;
- Lack of transportation options at night and on weekends;
- Difficulty of finding information on available services;
- Infrequent transit service on some routes;
- Need for advance scheduling decreasing potential demand;
- Increasing demand for dialysis-related transportation and transportation for other repetitive medical treatments;
- Aging of the Region's population and the growing transportation needs of seniors;
- Need to complete essential sidewalks, curb cuts, and other elements of the pedestrian infrastructure, especially along fixed and flex-route transit lines;

- Growing number of low-income residents living in suburban and rural settings with limited transportation options;
- Recognition that lack of transportation options for non-drivers is a high-priority, regional issue; and
- An overarching emphasis on coordination among agencies, funders, and users to ensure cost-effective use of the Region's transportation assets.

2008 Coordinated Plan Recommendations

- Coordinated travel information at the regional or county level;
- Connecting existing public transit services;
- Developing agency coordination agreements;
- Taxi subsidy options for project mobility trips;
- Vanpools for work and other trips;
- Expansion of current public transportation services;
- Brokering transportation operations;
- Additional local funding support for transportation options;
- Multi-county transportation services; and
- Regional transportation coordination.

2019 Updated Plan Recommendations

- Improve access to services through improved regional coordination;
- Access to employment by recruiting and training more paid and volunteer drivers;
- Enhance transportation for older adults and individuals with disabilities; and
- Promote capacity and information sharing among transportation providers.

Progress on Plan Findings and Recommendations

- Cross-county connections of transit agencies have improved significantly; Greene County flex service now connects from Xenia to the GDRTA Eastown and Downtown Dayton hubs and provides direct service to Sinclair Community College. In addition, GDRTA has added direct service to the Fairfield Mall area in Greene County and Miami County Transit has added connections to GDRTA in Montgomery County (Vandalia and Huber Heights), Greeneville Transit in Darke County, and to Shelby County Transit.
- In 2012, the Regional Directory of Transit and Human Services transportation was converted to a website: www.miamivalleyridefinder.org. This website lists contact information and services for public and non-profit transportation providers throughout Greene, Miami, Montgomery, and northern Warren counties.
- A mobility manager is now housed at Greene CATS. While the primary focus of this position is on Greene County residents, the mobility manager assists with regional issues including providing administration of the www.miamivalleyridefinder.org website. The mobility manager also provides travel training and referrals and other services to non-drivers.
- Job-related transit service connects residents of the men's homeless shelter with the Montgomery County Job Center and the downtown GDRTA hub.
- GDRTA now offers a door-to-door on-demand service called Connect On-Demand which partners with Dayton VA to transport clients using Lyft/Uber.
- Miami County Transit continues to look at opportunities to implement a flex/fixed route to complement the door-to-door service.
- Non-profit agencies such as the Life Enrichment Center have implemented volunteer driver programs to provide safe and affordable transportation options for non-drivers.

- The Senior Transportation Expansion Project in Montgomery County provided funding to support and expand transportation services provided by senior centers in various communities.
- Improvements to sidewalk infrastructure, including the addition of concrete passenger landing pads and ADA curb cuts in multiple jurisdictions, improved access to fixed-route transit for people with disabilities and older adults.
- Hosting coordinated driver training events by GDRTA and Goodwill Easter Seals of the Miami Valley improved access to driver training opportunities to small transportation providers.
- Dozens of human service agencies and community centers throughout Greene, Montgomery, Miami and northern Warren Counties were able to expand services, programs and provide increased transportation options for older adults, individuals with disabilities and low-income populations.

Greater Region Mobility Initiative Transportation Plan

In 2018, the Ohio Department of Transportation's Office of Transit sought to improve the way coordination occurred through the state funded Section 5310 Program by regionalizing the coordinated planning process. ODOT partnered with MVRPC to lead the planning process over an eight county region with what is known as the Greater Region Mobility Initiative (GRMI). The Greater Region consists of a mix of urban, suburban and rural populations and includes Champaign, Clark, Darke, Greene, Miami, Montgomery, Preble, and Shelby Counties.

Stakeholders from all counties in the Greater Region came together through a regional coordinated council to craft the framework which was used to draft a regional coordinated public human services transportation plan (GRMI Plan). The group identified similar challenges, needs, and opportunities occurring at the county level which translated into a regional focus.

Challenges to Regional Coordination

- Misaligned funding policies;
- Lack of communication;
- Lack of technology;
- Public awareness of available services; and
- Limited funding.

Regional Needs

- County-to-county transportation;
- Employment transportation;
- Aging vehicles and vehicle replacement;
- Expansion of services, both in hours and territory; and
- Public/private funding opportunities.

Regional Strengths & Opportunities

- Passion for mission;
- Strong Mobility Management network;
- Customer service;
- Knowledge of traffic patterns;

- Increased local support;
- Regional networking; and
- Improved county-to-county coordination.

MVRPC acts as the Regional Coordinating Agency (RCA) on behalf of ODOT to establish and update the regional Coordinated Public Human Services Transportation Plan. This GRMI Plan eliminates the need for individual county level plans and offers the opportunity for transit providers to increase access to transportation regionally.

Beginning in 2021, Clark, Darke, Preble, and Shelby counties will no longer be required to individually update and submit a local coordinated plan to ODOT. Instead, representatives in these counties will work with MVRPC as the RCA to update the GRMI Plan with county level data. MVRPC facilitated a process in 2020 which worked with rural county leadership to individually adopt the GRMI Plan allowing transit providers to remain eligible for the state funded Section 5310 Program. Additionally, MVRPC's Board of Directors adopted the plan on behalf of the region's MPO counties making them eligible to leverage funds from ODOT for regional projects.

As the RCA, MVRPC has an active role in facilitating coordination for both the GRMI and HSTC councils allowing for an increase of information sharing across the region. Each council will work to organize and provide structure within them to improve project coordination. Additionally, MVRPC will assist in coordinating project development for regional projects and provide funding recommendations to ODOT. This involvement will allow for a more responsible management of federal, state and local resources while ensuring an improvement in transit services throughout the Region.

Section 5310 Program

In 2012, MAP-21/FAST Act changed the long-established FTA Section 5310 program from a statewide allocation to a regional allocation for large urbanized areas like the Greater Dayton Urbanized Area. MAP 21 allocated specific apportionments to large urbanized areas (UZAs), small UZAs, and rural areas, made operating expenses eligible, and expanded coordinated plan requirements to include specific requirements for stakeholder involvement in development and approval of the plan. As a result, the Greater Dayton Urbanized Area now receives an annual allocation of funds to support the special transportation needs of seniors and individuals with disabilities.

The Miami Valley Regional Planning Commission is named the Designated Recipient for Section 5310 funds for Greene, Montgomery, Miami, and northern Warren Counties by the Governor of the State of Ohio. In that role, MVRPC is responsible for awarding program funds to ensure that transportation options for older adults and people with disabilities are maintained and improved. The primary method for achieving this goal is by providing financial support to non-profit agencies and government entities which supplement transportation services, along with developing a regionally coordinated plan and coordinating a regional Human Services Transportation Council to enhance coordination.

The Greater Dayton Regional Transit Agency (GDRTA) is a partner in administering the 5310 program and acts as the purchasing agent for the program. In addition, GDRTA maintains contractual agreements with agencies who receive Section 5310 vehicles throughout the useful life of the vehicle. Participating agencies

are expected to provide a payment equal to 20% of the value of the vehicle being purchased. The local match is paid in full when the vehicle is awarded and the contract is signed. When a vehicle reaches the useful life criteria established by FTA, the vehicle is no longer under contract and the operating agency is given the authority to continue using the vehicle for agency programming or properly dispose of the vehicle.

Agencies who receive Section 5310 funding are expected to follow a number of requirements to protect FTA liability of federally funded vehicles and to ensure the vehicle is used for the intended purpose by requiring annual reporting on utilization of vehicles, driver training schedules, maintenance schedules, annual vehicle inspections, etc. to ensure good repair of the vehicle and good use. Agencies which request 5310 funding or anticipate requesting 5310 funding are also required to be, or to become, active members of the Human Services Transportation Council and to track and report certain performance indicators and coordination efforts.

Under current law, competitive selection is allowed, but not required. A decision was made in 2017 to create a competitive selection process for the Greater Dayton Urbanized Area 5310 funding program to ensure that competitive projects are selected which not only improve a state of good repair for FTA assets, but ensure projects fill in a gap of need, reduce redundancies and overall achieve coordinated plan goals and objectives. The Miami Valley Regional Planning Commission since 2013 has approved funding for a number of projects to agencies throughout Greene, Montgomery, Miami, and northern Warren Counties to include accessible vehicles, pedestrian infrastructure improvements, enhanced access to transit, improved accessibility, preventive maintenance for vehicles that have been awarded through the 5310 process, and mobility management.

CHAPTER 7

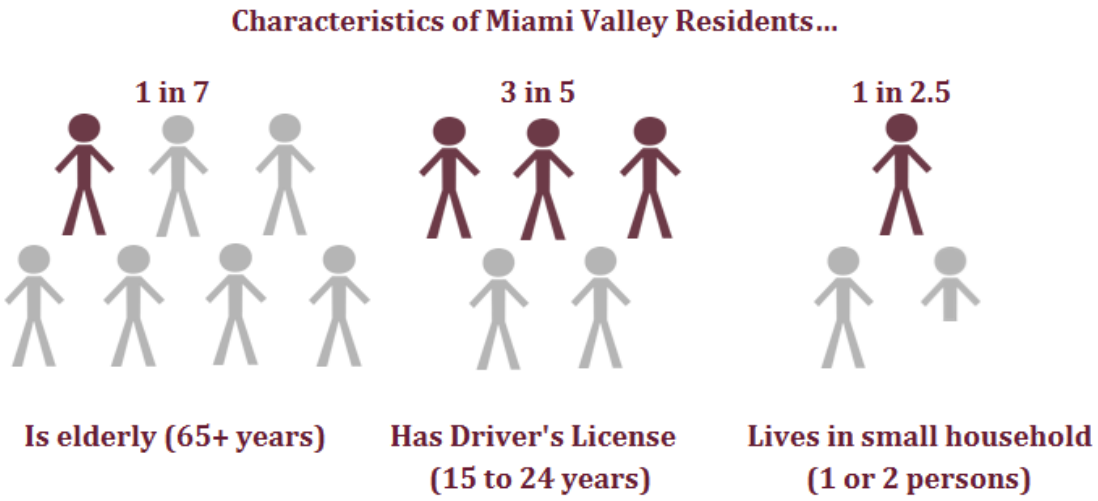
ALTERNATIVE MODES AND DEVELOPMENT CHOICES

7.1 Overview

As the Region grows, it is essential to plan a comprehensive transportation system that serves the needs of travelers using all modes of transportation, allowing for reasonable mobility choices for all residents. The 2050 LRTP addresses future transportation needs by including programs and projects that provide alternatives to traditional forms of transportation and thereby aid in curtailing the demand for single occupancy vehicle travel, reducing congestion, harmful emissions, and the reliance on petroleum-based products. Alternative modes and development choice strategies can also spur economic development in existing communities, create strong places with a sense of community, and help preserve open space and environmentally sensitive areas.

Trends

Between 2000 and 2010, the Region's elderly population (older than 65 years) increased by 16 percent while also experiencing a subtle increase in the amount of that population that lives in suburban and rural areas. At the same time, younger people are increasingly delaying the age at which they get their first driver's license. In 2013, approximately 62 percent of the population between the ages of 15 to 24 years had driver's licenses in the Miami Valley, and while this rate is higher than the national average, it is still lower than previous decades. Younger drivers are also more likely to drive less if driving costs increase and generally have a higher preference for living close to work. It is also important for elderly residents to live in an environment in which they are not being pushed to drive beyond the ages at which it is safe to do so.



On the household front, 40 percent of the household population in the Region now lives in a 1 or 2 person household, a 9 percent increase since 2000. Younger generations are also choosing to postpone homeownership; as a result, the region experienced a 10 percent increase in the population living in rental housing units between 2000 and 2010.

Population changes, transportation, and living preference shifts are combining into a non-traditional demand for varied living arrangements and transportation choices. On the housing end there is strong demand for senior/elderly housing as well as infill and urban housing. There is also interest in development of suburban areas near transit and other amenities. Successful regions will need to address these preferences to retain existing residents and attract new ones.

Improvements in transportation technologies are addressing some of these challenges. According to the U.S. Department of Transportation (U.S. DOT)'s *Shared Mobility: Current Practices and Guiding Principles* primer, the shared use of a vehicle, bicycle, or other mode is an innovative transportation strategy that enables users to have short term access to transportation modes on an "as-needed" basis. In 2021, MVRPC inventoried shared mobility services currently available in the Region; some of these services such as grocery and meal delivery have proven their worth during the Covid-19 pandemic. Shared mobility will continue to evolve and develop and as the menu of shared mobility options continues to grow, the public sector needs to respond with appropriate legislation to protect public safety and provide guiding policies to maximize benefits. Ongoing tracking and more research is recommended on emerging services to support sound planning and policymaking in the future. On a longer horizon, emerging self-driving and autonomous vehicle technologies will also impact congestion, mobility, safety, and development patterns.

Additional information about Dayton's Bike Share program, Link, is provided later in this chapter.

These demographic, socio-economic, and technology-oriented shifts are expected to continue into the future so it is increasingly important for regions to plan for and provide alternatives.

7.2 Funding Outlook

Financial forecasts for the programs and projects described in this chapter are based on annual averages as shown in the current SFY 2021-2024 TIP and are assumed to be in 2020 dollars. A summary is provided in Table 7.1 below and additional details can be found in the Financial Analysis Summary.

Table 7.1 — 2050 Forecasted Cost and Revenues for Alternative Modes (in millions of 2020 / Year of Expenditure dollars)

Program	Cost/Revenues					
	Four Year TIP (2021-2024)	Annual Average	Short Term Plan I-5 years (2021-2025)	Short Term Plan II-5 years (2026-2030)	Long Term Plan-10 years (2031-2040)/ (2041-2050)	For Full 30 Year Plan
RIDESHARE	1.86	0.47	2.33	2.33	4.66	13.98
Air Quality	1.76	0.44	2.20	2.20	4.40	13.20
Bikeway/Pedestrian	20.25	-	20.25	-	-	20.25
Total (2020/YOE dollars)	**8.83**	**-**	**24.78**	**4.53**	**9.06**	**47.43**

Source: MVRPC

7.3 Rideshare Program

Ridesharing and other travel demand management strategies are expected to continue to be important elements in the effort to reduce ground-level ozone (smog) and particle pollution. MVRPC's RIDESHARE Program promotes sustainable transportation options to reduce the use of single-occupancy vehicles to reduce carbon emissions contributing to poor air quality. The Program celebrated its 40th anniversary in 2019.

The Rideshare Program helps commuters with resources to form carpools or vanpools through ride-matching, find bike routes and transit options, or form bikepools. These resources are available at MiamiValleyRideshare.org. The Program is part of the statewide platform, GohioCommute.com which allows users to match with others across the State. The RIDESHARE Program is available for free to anyone who lives, works or attends college in Montgomery, Greene, Miami, Preble, Darke, and Clinton counties. For those who do not have access to the internet, a phone number is available 800.743.SAVE or local at 937.223.SAVE to reach a representative who will act on their behalf.

The Rideshare Program advertises across a variety of media outlets to reach commuters in the Region. The advertising messages promote the program resources and encourage commuters to try sustainable forms of transportation like carpooling, vanpooling, biking, walking, or riding transit to reduce traffic congestion and carbon emissions.

Another way MVRPC promotes transportation options that reduce carbon emissions is through the Drive Less Live More initiative. Drive Less Live More emphasizes trying sustainable options such as carpooling, walking, biking, or taking transit to events such as concerts or festivals to reduce air pollution and improve health outcomes.

In an effort to reduce traffic congestion and commuting delays sometimes created by construction projects, MVRPC has developed a website MiamiValleyRoads.org to provide a comprehensive summary of major construction projects in the Region. This website is updated weekly using the Ohio Department of Transportation's construction news emails. Social media posts are also scheduled with this same information each week. The website has projects listed by county or major route and provides user-friendly links to route planning tools, commute solutions, and other ideas to reduce congestion and prevent air pollution.

7.4 Air Quality Awareness Program

MVRPC's Air Quality Awareness Program is a public information/behavior modification campaign to inform Dayton/Springfield residents about ground-level ozone and particle pollution issues and how the general public's behavior can impact not only air quality, but also the Region's economy. MVRPC promotes actions that the general public can take to reduce air pollution incorporating FHWA's slogan, "It All Adds Up to Cleaner Air" that include:

- Driving less by carpooling, vanpooling, taking the bus, riding a bike or walking (coordination with MVRPC's RIDESHARE/ Alternative Transportation Program is emphasized);
- Keeping vehicles properly tuned, not "topping off" the tank, making sure the gas cap fits tightly, and refueling in the evening when smog is less likely to form;
- Mowing lawns in the evening and limiting the use of gasoline-powered lawn equipment; and
- Eliminating outdoor burning, including leaves, wood, or trash; mulching or composting leaves/yard waste; reducing or eliminating fireplace and wood stove use – consider retrofitting wood stoves with a filter or use gas logs instead.

The actions to reduce air pollution are promoted with tv, radio, print and digital advertisements and featured on MiamiValleyAir.org.

MVRPC receives updates about the air quality in the Region from the Regional Air Pollution Control Agency (RAPCA) who monitors air pollution levels year-round. If and when the Air Quality Index (AQI) is expected to be above 100, MVRPC, in coordination with RAPCA, issues an Air Quality Alert (AQA). When an AQA is issued for the area, MVRPC activates newspaper ads, billboard ads, and social media posts to notify the public of the poor air quality forecasted; a press release is sent to the media and stakeholders. The National Weather Service (NWS) is also notified to activate the Air Quality Alert across their NOAA radio network, their website, and social media account which triggers other outlets that monitor NWS activity to send alerts, most notably popular weather apps and websites. An email from U.S. EPA is also sent to those registered for notifications about the air quality in the Region.

MVRPC also supports RAPCA's Idle-Free Education Campaign. The two agencies developed a toolkit to provide to local schools, libraries, daycare centers, hospitals, parks and municipalities, to inform visitors that their campus is an Idle-Free Zone. Outdoor signage and informational brochures are made available free-of-charge to any organization wanting to implement the program.

7.5 Bikeway and Pedestrian Program and Projects

Bikeways and sidewalks are both important components of an intermodal transportation network since all transportation trips contain a pedestrian element at some point. In addition to maintaining a project listing of actual projects being implemented or planned for the future, MVRPC also conducts extensive outreach and planning efforts related to bikeway and pedestrian mobility.

The Miami Valley Comprehensive Local – Regional Bikeways Plan

This plan, originally adopted by the Board of Directors in December 2008, and updated in 2015, inventories bicycle facilities and identifies future bikeway connections at both the regional and local network levels. The purpose of the plan is to create a complete system of bicycle facilities that connect people to desired destinations – including their homes. Further, the plan encourages policies and programs that will foster increased bicycle use across the Miami Valley Region. The 2015 Update assesses both national and regional data regarding safety, barriers to cycling, and preferred cycling environments to highlight the general support for bike facilities that provide greater degrees of physical separation from motor traffic.

Adapting the "Level of Traffic Stress" (LTS) analysis methodology[3] for a regional (versus municipal) scale, the 2015 Update identifies locations where new low stress locations could improve bicycle connectivity for all. MVRPC staff mapped the entire Region to identify where the low-stress islands already exist. The initial premise was that the Miami Valley Trails network is a large low-stress (LTS 1) set of facilities as are residential streets. Roads that are federally functionally classified were assessed using the scale developed

[3] Mineta Transportation Institute, 2012

by the Mineta Institute. Most were found to be LTS 4 facilities (≥35 mph speeds), with a small minority found to be LTS 3 (≥30 mph speeds and/or 4 lanes). Using GIS analysis, the largest low stress islands were identified in terms of population and visual review was applied to the largest islands to identify potential projects that would provide low-stress connections from those islands to either the trails network or neighboring islands.

Figure 7.1 illustrates the LTS analysis using the transportation network in the Kettering/Beavercreek area. The complete regional maps can be found at http://www.mvrpc.org/transportation/bikeways-pedestrians/mvrpc-bikeways-plan.

The 2015 Update does not alter MVRPC's regional focus on bikeway infrastructure in the Miami Valley, completing key regional bikeways connections, and filling gaps in existing corridors remains a primary focus for the agency. But in addition, the 2015 Update also calls on jurisdictions in the Region to identify and build safe, convenient, and low stress connections from the regional bikeways to neighborhoods, parks, commercial centers, and downtowns that will enlarge the reach of the regional bicycle network. Each connection makes the whole system more valuable.

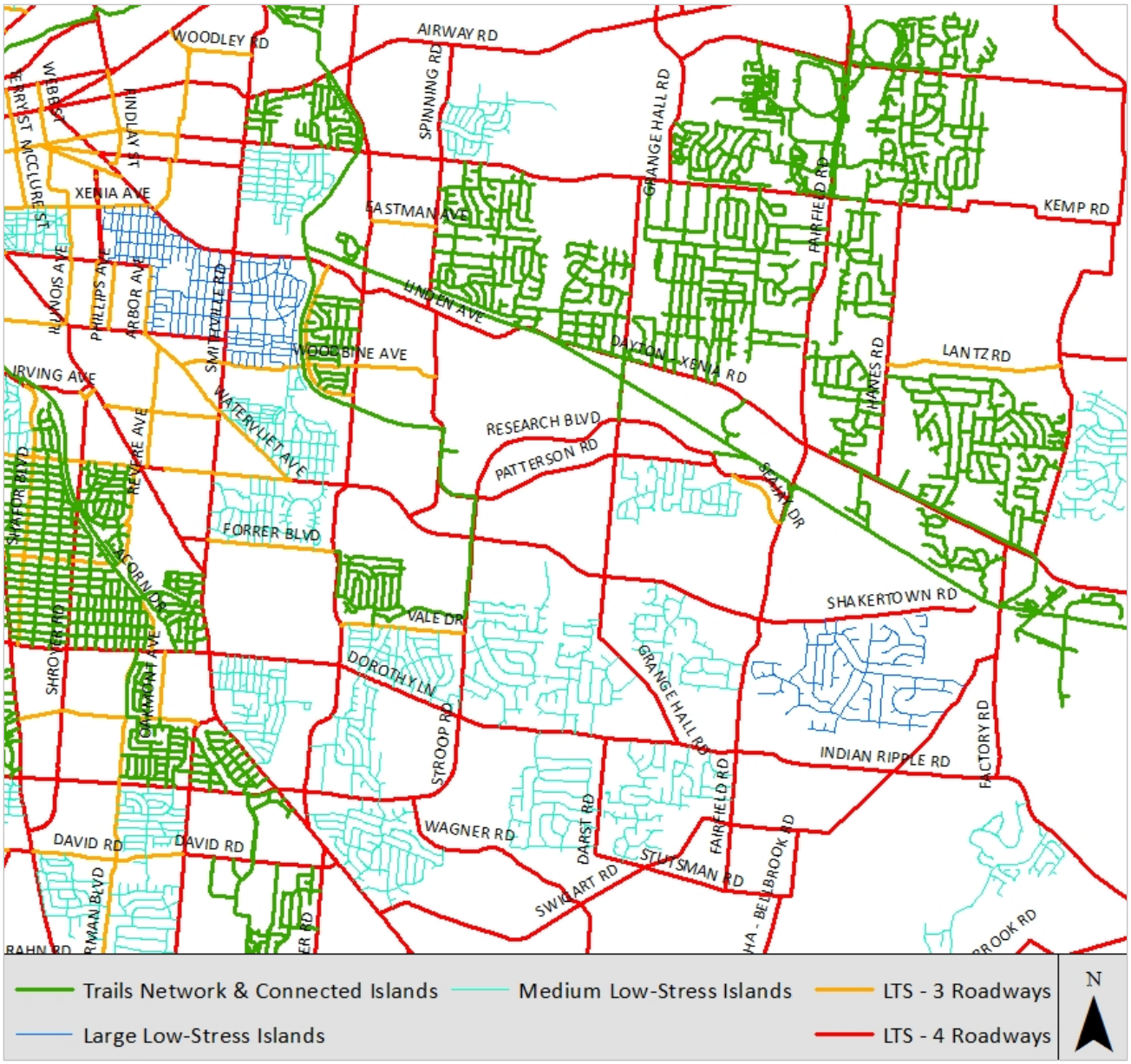
It is the intention of the Miami Valley Regional Planning Commission to update the Regional Bikeways Plan in 2022, and in the process broaden the scope of the plan into a "Regional Active Transportation Plan". The updated document will integrate recommendations supporting access to transit routes, pedestrian facilities, and accommodations for persons with disabilities in addition to bikeway projects recommendations. Since 2008, significant progress has been made in implementing the recommendations of the Plan. In addition to bicycle infrastructure, a number of non-infrastructure strategies have been initiated across the Region by MVRPC and/or partner agencies including:

Development of Complete Streets Policies — MVRPC adopted its Regional Complete Streets Policy in January 2011. The cities of Dayton, Riverside, Piqua, Troy and the Village of Yellow Springs have also adopted similar policies for their jurisdictions.

Yellow Springs also developed an Active Transportation Plan for the village encompassing bicycling, pedestrian, transit, and accommodations for persons with disabilities.

Creation of a Regional Bikeways Committee — The committee evolved from an existing committee of trail managing agencies, with the significant inclusion of member jurisdictions interested in adding on-street bike infrastructure to their communities. Active participants have included Dayton, Kettering, Riverside, Springboro, Troy, and Yellow Springs.

Figure 7.1 — Bikeway Level of Stress Analysis



Bicycle and Pedestrian Counts — With the cooperation of the trail managing agencies, comprehensive Trail User Surveys were completed in 2009, 2013 and 2017. The Summer of 2021 is the next scheduled survey year. MVRPC initiated a multi-faceted bicycle count program in 2015 including aggregations of trail counter data and use of on-road bicycle counters. Available bicycle counts have now been added to the Online Traffic Count Viewer.

Continued Support for the Regional Bikeways Map — MVRPC and partner agencies last updated the regional bikeways map in 2020. In addition, the cities of Dayton, Piqua, Kettering, and Springboro, and the village of Covington developed and distributed their own map of bike routes and bike-friendly streets.

D*evelopment of Public Service Announcements (PSAs)* — Two safety PSAs were developed featuring the Executive Directors of both MVRPC and Bike Miami Valley regarding safe cycling with motor traffic on the regionals roads. Bike Miami Valley is the regional cycling advocacy organization.

Miami Valley Cycling Summits — MVRPC, Bike Miami Valley, and numerous regional partners have held six Summits in Dayton (2009 and 2011), Springfield (2013), Piqua (2015), Fairborn (2017), and Miamisburg (2019). The May 2021 Summit will be held virtually due to the Covid-19 pandemic with Kettering as the host community.

Continued Support for Bike Month/Bike to Work Week/Bike to Work Day — MVRPC and Five Rivers MetroParks continued the downtown Dayton Bike to Work Day program and saw significant growth in attendance over the last ten years. With the event at RiverScape MetroPark, attendance peaked at over 700 in 2015, with more than 560 riders attending in 2019.

Coordinated Marketing — In early 2012, MVRPC and a consortium of partners, including park districts, transit agencies, and convention and visitors bureaus re-launched a one-stop cycling information web site for the Miami Valley, www.miamivalleytrails.org. This site was further updated in 2017 to be mobile-friendly. Also, the trail managing agencies agreed on a unified policy regarding use of electric bicycles throughout the reginal bikeway network in early 2019.

The 2015 Bikeway Plan Update also includes a number of policy recommendations to develop a supportive cycling ecosystem in the Miami Valley including:

- Continued support for funding bicycle and pedestrian infrastructure, at the federal, state, regional, and local level.
- Promotion of the Miami Valley Trails as a regional transportation asset, a business development opportunity, and a draw for out-of-region tourists.
- Enhanced partnerships: Continue to develop relationships with Bike Miami Valley to amplify the agency's voice and increase the reach of the agency's messages. Develop connections to the League of American Bicyclists and continue to encourage jurisdictions in the area to seek Bike Friendly Community status.

The 2015 plan also lists numerous program suggestions under the other Es: Education, Encouragement, Enforcement, Equity, and Evaluation. The plan recognizes that effective implementation of these non-engineering programs is essential to achieving the success of the Region's bicycle transportation goals.

Bikeway and Pedestrian Projects

Table 7.2 lists projects with local, state, or federal funds committed for implementation. These projects represent approximately $20.25 million of investment. The Long Range Regional Bikeway and Pedestrian Project list presented in Table 7.3 includes proposed long range regional bikeway and pedestrian projects for the east-west and north-south corridors, with a total cost of $91.85 million. Figure 7.2 – Regional Bikeway and Pedestrian Projects, shows the location of all existing and proposed regional bicycle/pedestrian ways.

Table 7.2 — Funded Regional Bikeway and Pedestrian Projects (SFY 2021-2025)

(Cost in Year of Expenditure dollars)

Corridor Direction	Corridor Name	Map Label	Bikeway Limits	Owner / Maint.	Type of Facility	Width (feet)	Length (miles)	Cost
East-West	Ohio-to-Indiana Trail	A2a	Construct shared use path between Troy-Sidney Road and North Casstown-Sidney Road via Garbry's Big Woods Reserve/Sanctuary.	Miami County Park District	Off-Street	10	3.5	$2,820,470
East-West	Great Miami-Little Miami Connector Trail	F1b	Along Clear Creek from Hazelwood Park to Community Park-Construction of a 10' wide shared use path. A bridge will be utilized to cross Clear Creek just north of Hazelwood Park and the bikepath will cross below the I-75 bridge crossing Clear Creek.	Franklin	Off-Street	12	2.0	$2,721,946
East-West	Wolf Creek Trail	G2a	Construct multi-use path following Wolf Creek from W Hillcrest Ave. at Hickorydale Park to James H. McGee Blvd. at the Wesleyan MetroPark.	Five Rivers MetroParks	Off-Street	10	2.3	$4,059,587
North-South	Iron Horse Trail	J3b	Replacement of 5' wide sidewalk with a 10' wide multi-use path adjacent to Bigger Road and Whipp Road and bike route signage on Hewitt Avenue.	Centerville/ Kettering	On/Off-Street	Varies	1.5	$555,000
North-South	Great Miami River Trail	K10b	Construct trail on the west bank of the Great Miami River from current trail terminus at Courtyard Hotel to W. River Road.	Dayton	Off-Street	12	1.0	$481,000
North-South	Great Miami River Trail	K12	East of Goodrich Giles Park over the Great Miami River at the south end of Piqua, replace bridge with ADA compliant structure.	Piqua	Off-Street	10	0.5	$2,119,299
East-West	Old National Road Trail	Z2	Construct a bikeway through Englewood MetroPark using marked park roads, new shared use path, and a new covered bridge.	Five Rivers MetroParks/ Englewood	Off-Street	12	2.3	$4,426,886
East-West	Old National Road Trail	Z3a	Construct bikeway from existing bikeway along National Road at Foley Drive, traveling adjacent to and through Cassell Hills Golf Course and Miami Conservancy District land to connect to the Great Miami River Trail near the Taylorsville Dam.	Vandalia, Dayton	On/Off-Street	Varies	2.4	$3,063,098
Regional Totals for Short Range Projects							**15.5**	**$20,247,286**

Source: MVRPC

Table 7.3 — Long Range Regional Bikeway and Pedestrian Projects (Unfunded - Cost in 2020 dollars)

Corridor Direction	Corridor Name	Map Label	Bikeway Limits	Owner / Maint.	Type of Facility	Width (feet)	Length (miles)	Cost
East-West	Ohio-to-Indiana Trail	A1	From the existing Cardinal Trail bike route, traveling north on High St. to abandoned Conrail ROW, then east along Conrail ROW.	Miami County Park District	Off-Street	10	3.5	$778,179
East-West	Ohio-to-Indiana Trail	A2b	Construct shared use path between North Casstown-Sidney Road and Miami/Champaign county line.	Miami County Park District	Off-Street	10	5.5	$4,432,167
East-West	Great Miami River Trail	AA1	Construct trail on/along West River Road to Sun Watch Village.	Dayton	Off-Street	10	1.3	$323,295
East-West	Possum Creek Jefferson Township Connector	AA2	Construct trail from Possum Creek MetroPark to Arthur Fisher Park and along Dayton-Liberty Road to Union Road.	Jefferson Twp., Montgomery County	On/Off-Street	Varies	3.8	$570,000
East-West	Fairborn-Yellow Springs-Cedarville Connector Trail	B3	Widen/add shoulders on Black Lane, Armstrong Road, W Enon Road, N Enon Road, Cornerstone Trail and Yellow Springs-Fairfield Road to the Little Miami Scenic Trail.	Greene County, Fairborn, Yellow Springs	On-Street	6	8.2	$3,295,240
East-West	Fairborn-Yellow Springs-Cedarville Connector Trail	B4	Widen shoulders on SR 343 and SR 72 between Yellow Springs and Cedarville.	Greene County	On-Street	6	7.7	$2,633,212
East-West	Germantown-Spring Valley-Bowersville Connector Trail	C1	Construct shared use path along Twin Creek between Main St. and SR 4/SR 725 intersection.	Germantown	Off-Street	10	1.0	$286,691
East-West	Germantown-Spring Valley-Bowersville Connector Trail	C2	Widen shoulders on Lower Miamisburg Rd./Riverview Ave./Maue Rd. between SR 4 and Alexandersville Rd.	Montgomery County, Miamisburg	On-Street	Varies	6.8	$2,837,899
East-West	Germantown-Spring Valley-Bowersville Connector Trail	C4	Retrofit Spring Valley Pike to include bike lanes between Yankee St. and McEwen Rd.	Washington Township	On-Street	6	0.4	$123,532
East-West	Germantown-Spring Valley-Bowersville Connector Trail	C7	From existing SR 725 bikeway, traveling east from Marwyck Dr. to Wilmington Pike.	Centerville	Off-Street	12	0.7	$253,113
East-West	Germantown-Spring Valley-Bowersville Connector Trail	C8	Traveling east along SR 725, from Wilmington Pike to 0.02 miles east.	Bellbrook	Off-Street	12	0.0	$25,000
East-West	Germantown-Spring Valley-Bowersville Connector Trail	C9	Traveling east along SR 725, from Bellevue Dr. to Rosecrest Dr.	Bellbrook	Off-Street	12	0.5	$123,127

Table 7.3 — Long Range Regional Bikeway and Pedestrian Projects (Unfunded - Cost in 2020 dollars)

Corridor Direction	Corridor Name	Map Label	Bikeway Limits	Owner / Maint.	Type of Facility	Width (feet)	Length (miles)	Cost
East-West	Germantown-Spring Valley-Bowersville Connector Trail	C10	From Sackett-Wright Park in Bellbrook to the Little Miami Scenic Trail.	Greene County	Off-Street	10	4.6	$1,100,000
East-West	Germantown-Spring Valley-Bowersville Connector Trail	C11	Widen shoulders between Spring Valley and Bowersville via Spring Valley-Pointersville Rd. and Hussey Rd.	Greene County	On-Street	6	16.3	$5,512,398
East-West	Mad River Trail	E4	Northeast from existing Mad River Corridor Bikeway along former railroad to Enon.	Greene County Park District	Off-Street	10	2.8	$599,592
East-West	Great Miami-Little Miami Connector Trail	F1a	Construct shared use path along SR 123 and Clear Creek between downtown Franklin and the western side of I-75.	Warren County	Off-Street	12	1.0	$1,360,973
East-West	Great Miami-Little Miami Connector Trail	F1c	Construct a shared use path along the southern side of Clearcreek Park, between Clear Creek and Lower Springboro Rd.	Warren County	Off-Street	12	0.5	$680,487
East-West	Great Miami-Little Miami Connector Trail	F2	Widen shoulders on Lower Springboro Rd. between proposed Clear Creek Trail and US 42.	Warren County	On-Street	6	8.7	$2,984,977
East-West	Wolf Creek Trail	G2b	Construct multi-use path connecting the Wolf Creek Recreation Trail to W. Hillcrest Ave. at Hickorydale Park. The path will extend the existing trail to Olive Road and follow Olive Road and Wolf Creek Pike before traveling east along the Wolf Creek to meet G2a at W. Hillcrest Ave.	Five Rivers MetroParks	Off-Street	10	2.4	$4,215,404
East-West	Wolf Creek Trail	G3	Construct Shared use path between existing Wolf Creek Trail (near Dodson) and Montgomery/Preble County line.	Five Rivers MetroParks	Off-Street	12	2.2	$532,040
North-South	Bellbrook-Fairborn Connector Trail	I1	Signed shared roadway from SR 725 along W. Walnut St. to existing bikeway at Bellbrook Park.	City of Bellbrook	On-Street	Varies	0.3	$135,402
North-South	Bellbrook-Fairborn Connector Trail	I2c	From the existing bikeway, traveling north along Upper Bellbrook/Feedwire/S. Alpha-Bellbrook/Stutsman/N. Fairfield Rds., to Shakertown Rd.	Greene County	Off-Street	10	4.0	$984,402
North-South	Bellbrook-Fairborn Connector Trail	I4	WSU to Kauffman Ave. Bikeway traveling north from Colonel Glenn Hwy. to Wright State Road.	Wright State University	Off-Street	10	1.0	$231,788

Table 7.3 — Long Range Regional Bikeway and Pedestrian Projects (Unfunded - Cost in 2020 dollars)

Corridor Direction	Corridor Name	Map Label	Bikeway Limits	Owner / Maint.	Type of Facility	Width (feet)	Length (miles)	Cost
North-South	Bellbrook-Fairborn Connector Trail	I5	Construct sidepath from Old Mill Lane to Kemp Rd.	Beavercreek	Off-Street	8	2.5	$1,000,000
North-South	Iron Horse Trail	J4	Extend Iron Horse Trail from Alex Bell Road to Social Row Road using Willowhurst, Zengel, Pleasant Hill, N Johanna, Franklin, S Johanna, Bethel, Clareridge, Susan, Spring Valley and Atchison Roads.	Centerville	On-Street	Varies	4.2	$675,493
North-South	Great Miami River Trail	K7	Traveling north from Johnston Farm to the County Line.	Miami County Park District	Off-Street	10	2.1	$456,557
North-South	Stillwater River Trail	L1	From existing bikeway at Sinclair Park, traveling north to Grossnickle Park.	Five Rivers Metro-Parks/Various	Off-Street	10	4.7	$2,990,725
North-South	Stillwater River Trail	L3	From the existing Englewood Reserve Bikeway, traveling north along the Stillwater River corridor, to SR 55.	Miami County Park District	Off-Street	10	10.4	$3,413,921
North-South	Stillwater River Trail	L5	Construct shared use path roughly paralleling SR 48 between Covington and Ludlow Falls.	Miami County Park District	Off-Street	10	10.0	$2,051,460
North-South	Wolf Creek Connector Trail	M1	Widen shoulders along Union Rd. from the Wolf Creek Bikeway to the existing path at I-70.	Englewood, Trotwood	On-Street	6	4.1	$1,688,055
North-South	Wolf Creek Connector Trail	M2	Widen shoulders along US 40 from Union Blvd. to the Englewood Reserve (also serves the Old National Road Trail).	Englewood	On-Street	6	0.6	$249,370
North-South	Wolf Creek Connector Trail	M3	Widen shoulders on Union Rd. between Existing Wolf Creek Trail in Trotwood and SR 725.	Montgomery County	On-Street	6	11.6	$3,975,305
East-West	Great-Little Trail	N1	Construct shared use path along Miamisburg-Springboro Rd./Austin Pike/Social Row Rd. between Medlar Rd. and Wilmington-Dayton Rd.; widen shoulders on Ferry Rd./Lytle Rd. between Wilmington-Dayton Rd. and North St. in Corwin; develop signed on-street bikeway.	Mont. County, Centerville Washington Park District	On/Off-Street	Varies	10.7	$2,491,329
North-South	Bowersville-Jamestown-Clifton Connector Trail	O1	Widen shoulders on SR 72 between Bowersville and Jamestown.	Greene County	On-Street	6	5.4	$1,842,903
North-South	Bowersville-Jamestown-Clifton Connector Trail	O2	Widen shoulders on Charleston Rd. and Selma-Jamestown Rd. between Jamestown and Greene/Clark County line.	Greene County	On-Street	6	10.4	$3,506,843

Table 7.3 — Long Range Regional Bikeway and Pedestrian Projects (Unfunded - Cost in 2020 dollars)

Corridor Direction	Corridor Name	Map Label	Bikeway Limits	Owner / Maint.	Type of Facility	Width (feet)	Length (miles)	Cost
North-South	Troy-Fletcher Connector Trail	P1	Widen shoulders along SR 55 and SR 589, providing an on-street bikeway linking Troy, Casstown, and Fletcher.	Troy, Miami County Park District	On-Street	6	10.6	$3,596,324
East-West	Cardinal Trail	Q1	Widen roadway shoulders along the Cardinal Trail route (Covington-Gettysburg Rd.) between Covington and the Miami/Darke County line.	Miami County Park District	On-Street	6	4.7	$1,564,309
East-West	Cardinal Trail	Q2	Widen roadway shoulders along the Cardinal Trail route between Covington and the Miami/Champaign County line. (Spring St., CR 30, Farrington Rd., Peterson Rd., Alcony-Canover Rd., Loy Rd.)	Miami County Park District	On-Street	6	20.1	$6,722,240
East-West	Laura-Troy Connector Trail	R1	Construct shared use path along former railroad corridor between Laura and Ludlow Falls.	Miami County Park District	Off-Street	10	6.6	$1,388,219
East-West	Laura-Troy Connector Trail	R2	Construct shared use path roughly paralleling SR 55 and along former Penn Central Railroad between Ludlow Falls and Troy.	Miami County Park District	Off-Street	12	7.6	$1,920,678
North-South	SR 741 Bikeway	T1a	Construct bike facility along SR 741 from the Cox Arboretum entrance to the north terminus of the facility constructed under PID #90289.	Montgomery County	On/Off-Street	Varies	0.5	$183,000
North-South	SR 741 Bikeway	T1b	Construct bike facility along SR 741 between Mall Park Drive and Ferndown Drive.	Montgomery County	On/Off-Street	Varies	1.7	$623,000
North-South	SR 741 Bikeway	T1c	Construct a bike facility along SR 741 from entrance to Waldruhe Park to Austin Pike.	Montgomery County	On/Off-Street	Varies	0.6	$220,000
North-South	SR 741 Bikeway	T2a	Construct bike lanes on SR 741 between Austin Pike and the current terminus of the bike lanes approx. 1,000 feet south of W. Tech Drive.	Springboro, Warren County	On-Street	6.0	0.2	$56,000
East-West	Carriage Hills Connector Trail	U1	Connect Great Miami River Trail and Carriage Hills MetroPark via shared use path through Carriage Trails development.	Various	Off-Street	12	4.2	$1,063,000
North-South	Carriage Hills Connector Trail	U2	Connect Carriage Hills MetroPark and New Carlisle via widened shoulders on SR 202, Singer Rd., Palmer Rd., SR 571, Dayton-Brandt Rd., and shared use path on former railroad corridor between Dayton-Brandt Rd. and New Carlisle.	Miami County Park District, Montgomery County	On/Off-Street	Varies	8.0	$2,431,000

Table 7.3 — Long Range Regional Bikeway and Pedestrian Projects (Unfunded - Cost in 2020 dollars)

Corridor Direction	Corridor Name	Map Label	Bikeway Limits	Owner / Maint.	Type of Facility	Width (feet)	Length (miles)	Cost
North-South	Carriage Hills Connector Trail	U3	Connect Huffman MetroPark and Carriage Hill MetroPark via Union School House, Baker, Kitridge, and Bellefontaine Roads.	Montgomery County, Five Rivers MetroParks	On-Street	Varies	8.3	$2,302,289
East-West	Great Miami River-Centerville Connector Trail	V1	Construct trail following local streets and shared use paths connecting Moraine, West Carrollton, Washington Township, Centerville, and Bellbrook via Cox Arboretum, Yankee Park, Grant Park and Pleasant Hill Park.	Various	On/Off-Street	Varies	8.2	$1,881,895
East-West	Great Miami River-Creekside Connector Trail	X1	Construct trail extension roughly paralleling US 35 to 4th St. along RR ROW then west to Keowee St and north to Monument Avenue.	Dayton, Five Rivers MetroParks	Off-Street	12	3.1	$6,000,000
NA	Troy Bikeway Hub	Y1	Construct Troy Bike Hub structure.	Troy	NA	NA	0.0	$200,000
NA	Piqua Bikeway Hub	Y2	Redevelop a historical building into a Bike Hub at the intersection of the GMR trail and the Piqua-Covington Fletcher Trail.	Piqua	NA	NA	0.0	$500,000
East-West	Old National Road Trail	Z1a	Construct a bikeway paralleling US 40 from the intersection with The Wolf Creek Trail to Northmont Schools property.	Montgomery County, Five Rivers MetroParks	On/Off-Street	Varies	5.9	$1,467,259
East-West	Old National Road Trail	Z1c	Construct a bikeway paralleling US 40 from Centenial Park in Englewood to Englewood MetroPark.	Englewood	On/Off-Street	Varies	0.8	$106,400
East-West	Old National Road Trail	Z3b	Construct bikeway paralleling US 40 from Frederick Pike to James Bohanan Drive through Dayton Airport property and City of Vandalia.	Vandalia	On/Off-Street	Varies	4.2	$1,262,889
Regional Totals for Long Range Projects							**255.22**	**$91,849,382**

Source: MVRPC

Dayton Bike Share Program — Link

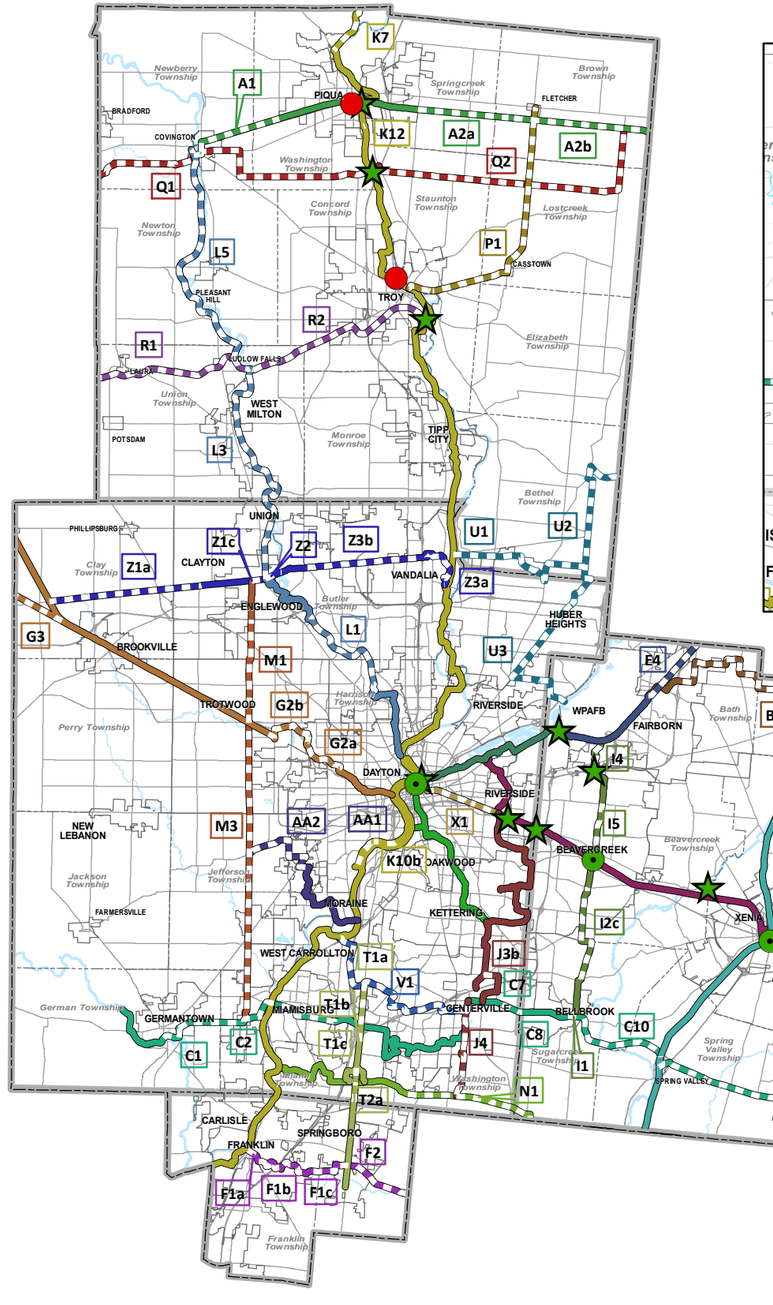
The Dayton Bike Share program, Link, opened for operation on May 5, 2015 and was made possible by a strategic partnership of more than a dozen entities. The original capital improvements were funded by MVRPC's Surface Transportation Program (STP). The Greater Dayton RTA maintains the bike share equipment and balances the distribution of bikes across the network and Bike Miami Valley handles customer memberships, organizational partnerships, education, as well as marketing and promotions. Bike sharing offers several economic, livability, transportation, environmental, and health benefits to the businesses, employees, visitors, and residents of downtown Dayton and surrounding neighborhoods. It reduces the carbon footprint and frustration with moving a car and parking. Link has expanded to 27 strategically located stations, within an approximate two mile radius of downtown Dayton. In 2020, Link added 100 e-bikes to the network and transitioned away from a docked bikeshare system. Since 2015, users took over 142,500 trips, and rode over 316,500 miles. The program has attracted over 18,500 unique riders.

7.6 Development Choices – Going Places

In April 2012, the MVRPC Board of Directors endorsed the Concentrated Development Vision resulting from the Going Places initiative. In this Vision, development would be concentrated around regional assets and in areas that already have infrastructure; rehabilitation and/or repurposing of vacant and underused structures would be encouraged; and the preservation of agricultural land and other open space would be a priority. More specific characteristics are detailed below and illustrated in Figure 7.3.

- Encourage the rehabilitation and/or repurposing of existing structures.
- Focus on the maintenance of existing infrastructure.
- Locate any new development in areas with existing infrastructure.
- Revive the Region's older communities.
- Preserve prime farmland and support agricultural enterprise.
- Improve the quality of educational opportunities throughout the Region.
- Foster a sense of connection and cooperation between the Region's communities.
- Increase the number and quality of transportation options.
- Encourage development around the Region's assets.
- Encourage the rehabilitation and/or reuse of vacant industrial sites.
- Encourage energy-efficient building practices and the retrofitting of older structures for energy efficiency.
- Use land in a way that builds a sense of community.
- Maintain and expand the Region's parks, natural areas, and recreation amenities.
- Encourage the development of quality, realistic, affordable housing throughout the Region.
- Revive the Region's core city—the City of Dayton.

Figure 7.2
Regional Bikeway & Pedestrian Network



- Bellbrook-Fairborn Connector (I)
- Bowersville-Jamestown-Selma Connector (O)
- Cardinal Trail (Q)
- Carriage Hills Connector (U)
- Creekside Trail
- Dayton-Kettering Connector (J)
- Fairborn-Yellow Springs-Cedarville Connector (B)
- Germantown-Bowersville Connector (C)
- Great Miami River Trail (K)
- Great Miami River-Centerville Connector (V)
- Great Miami River-Creekside Connector (X)
- Great Miami-Little Miami Connector (F)
- Great-Little Trail (N)
- Iron Horse Trail (J)
- Laura-Troy Connector (R)
- Little Miami Scenic Trail
- Mad River Trail
- Ohio to Indiana Trail (A)
- Ohio-to-Erie Trail
- Old National Road Trail (Z)
- Possum Creek Jefferson Township Connector (AA)
- SR 741 Corridor (T)
- Simon Kenton Trail
- Stillwater River Trail (L)
- Troy-Fletcher Connector (P)
- Wolf Creek Connector (M)
- Wolf Creek Trail (G)
- Wright Brothers-Huffman Prairie Trail (E)
- Xenia-Jamestown Connector

Existing Bikeway Hub
Proposed Bikeway Hub
Existing Bikeway Bridges/Tunnels
Proposed Bikeway Bridges/Tunnels
Existing Trail
Proposed Trail

May 2021

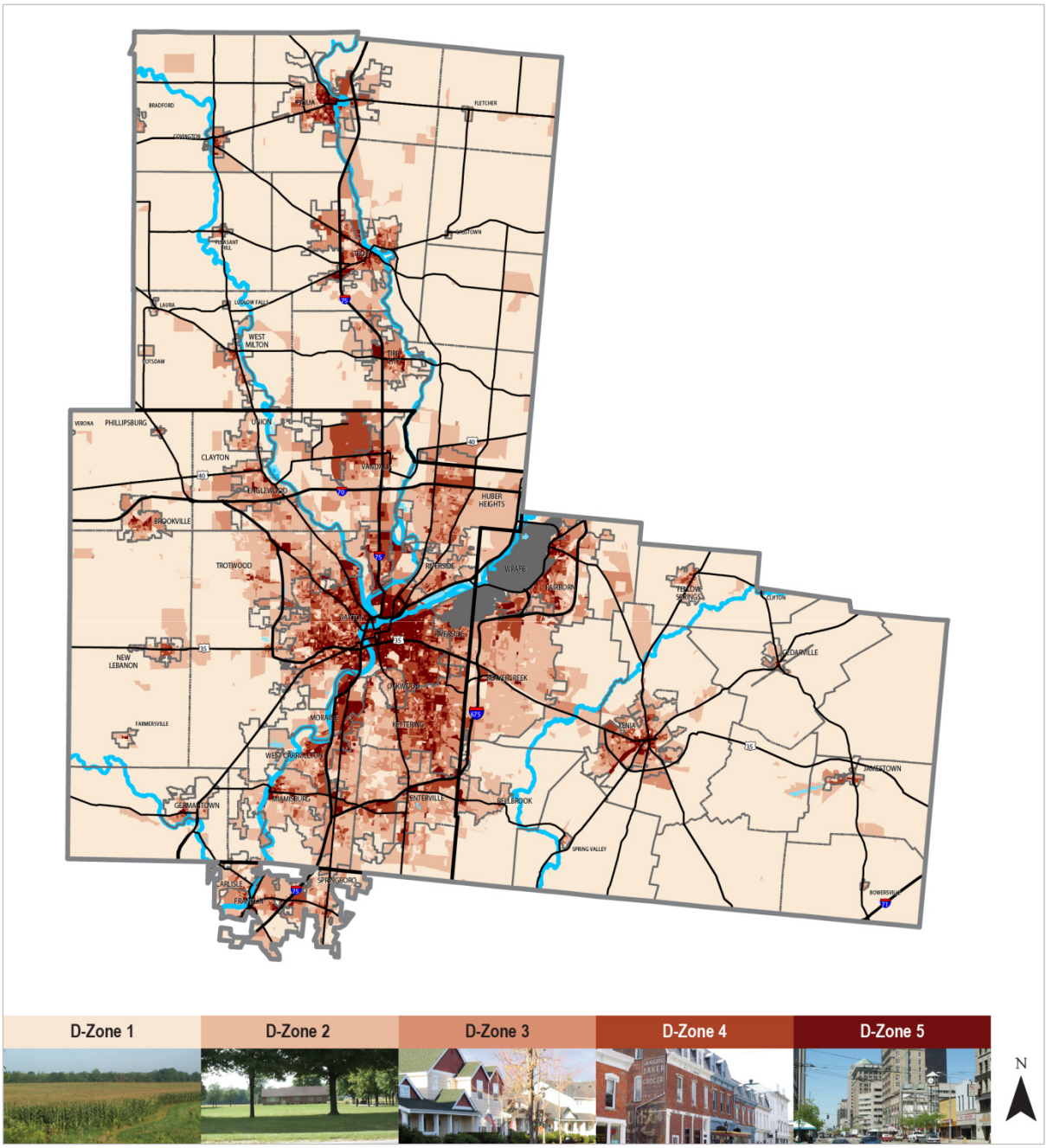
N

0 2 4 6 8 Miles

Going Places committees also identified a set of eleven implementation tools to support the Concentrated Development Vision. The tools address the following major needs:

- Providing better information for strong decision making;
- Strengthening regional collaboration; and
- Building the Region's capacity for solutions.

Figure 7.3 — Concentrated Development Vision



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CHAPTER 8

TRANSPORTATION PERFORMANCE MANAGEMENT

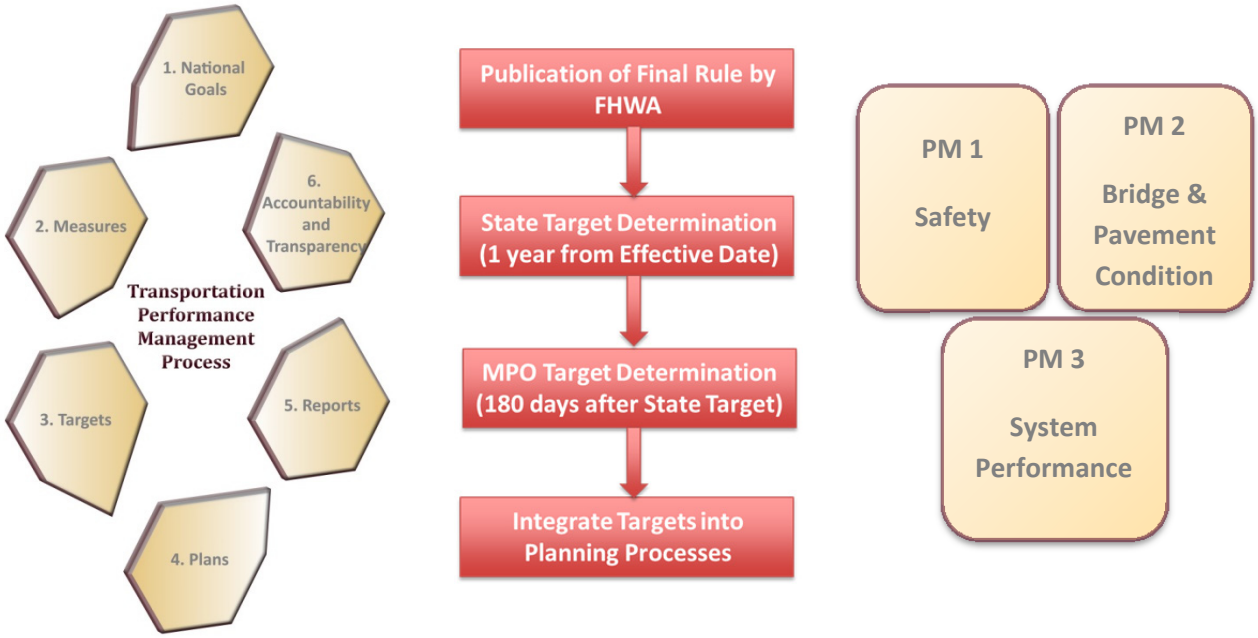
8.1 Overview

Transportation Performance Management (TPM) is a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. Figure 8.1 provides an overview of the planning rule framework for TPM, FHWA established target setting process, and required performance measures. This chapter serves the role of the **System Performance Report** for the MVRPC Long Range Transportation Plan.

Planning Rule Framework

The FAST Act requires state departments of transportation (DOTs), transit agencies, and metropolitan planning organizations (MPOs) to conduct performance-based planning by tracking performance measures and establishing data-driven targets to improve those measures in a coordinated process to ensure consistency.

Figure 8.1 — Transportation Performance Management Process



The Federal Highway Administration (FHWA) organized the many performance-related provisions within the FAST Act for recipients of federal-aid highway funding into six elements: National goals or programs to focus the federal-aid highway program on specific areas of performance; Establishment of measures by FHWA to

assess performance and condition in order to carry out performance-based federal-aid highway programs; Establishment of targets for each of the measures to document expectations of future performance; Development of strategic and/or tactical plans to identify strategies and investments that will address performance needs; Development of reports that would document progress toward the achievement of targets, including the effectiveness of federal-aid highway investments; and requirements developed by FHWA to use to achieve or make significant progress toward achieving targets established for performance.

The FAST Act also furthers several important goals with respect to public transportation, including safety, state of good repair, performance, and program efficiency. The FAST Act gives the Federal Transit Administration (FTA) significant new authority to strengthen the safety of public transportation systems throughout the United States. The FAST Act also put new emphasis on restoring and replacing aging public transportation infrastructure by establishing a new needs-based formula program and new asset management requirements.

Under this framework, FHWA and FTA have established a set of rulemakings for implementation of Performance-Based Planning and Programming (PBPP). FHWA published three Performance Measures (PM) rules that established performance measures to monitor the performance of safety (PM 1), bridge and pavement conditions (PM 2), and system performance (PM 3) while the FTA published rules to monitor Transit Asset Management (TAM) and develop Public Transportation Agency Safety Plans (PTASP). The rules indicate how State DOTs, MPOs, and transit agencies should set targets, report progress, and integrate performance management into their Long Range Transportation Plans (LRTPs) and Transportation Improvement Programs (TIPs).

The performance measures and standards are based on national goals and aligned to various program and policy areas including the National Highway Performance Program (NHPP), Highway Safety Improvement Program (HSIP), the Congestion Mitigation and Air Quality Improvement Program (CMAQ), and the National Freight Policy.

Target Setting Options

According to the USDOT, all state DOTS and transit agencies must set targets for the established performance measures within one year of respective final rule implementation, and all MPOs including MVRPC must either: 1) establish their own quantifiable targets for their metropolitan planning, or 2) support the statewide/regional targets as established by the state DOT or transit agency, no later than 180 days after the state adopts its targets. To date, MVRPC has decided to support all applicable performance targets established by ODOT and the regional transit agencies. Table 8.1 provides a summary of all applicable performance measures in the MVRPC MPO region, established targets for those measures, and the most recent MVRPC Board of Directors resolution adoption date in support of those targets.

Assessment of Significant Progress

The assessment of significant progress is conducted by FHWA at the state level wherein the FHWA determines whether ODOT has met or made significant progress towards meeting the adopted targets. FHWA does not directly assess MPO progress towards meeting targets; however, FHWA will review MPO

Table 8.1 — Summary of MVRPC Supported ODOT Performance Targets

Target Areas		Performance Measures	Network	Target Adoption Date	Target Adopted
PM 1	Safety	Number of Fatalities	All Public Roads (Applicable to MPO)	November 2020	1,084
		Rate of Fatalities			0.93
		Number of Serious Injuries			8,101
		Rate of Serious Injuries			6.97
		Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries			811
PM 2	Pavement Condition	Percentage Interstate System in Good Condition	Interstate System (Applicable to MPO)	October 2018	50%
		Percentage Interstate System in Poor Condition			1%
		Percentage non-Interstate System in Good Condition	NHS Non-Interstate (Applicable to MPO)	October 2018	35%
		Percentage non-Interstate System in Poor Condition			3%
	Bridge Condition	Percentage of NHS bridges by deck area in Good condition	NHS (Applicable to MPO)	October 2018	50%
		Percentage of NHS bridges by deck area in Poor condition			5%
PM 3	NHS Travel Time Reliability	Percent of Person-Miles Traveled on the Interstate System that are Reliable	Interstate System (Applicable to MPO)	October 2018	85%
		Percent of Person-Miles Traveled on the Non-Interstate System that are Reliable	NHS Non-Interstate (Applicable to MPO)	October 2018	80%
	Freight	Truck Travel Time Reliability (TTTR) Index	Interstate System (Applicable to MPO)	October 2018	<1.5
	Total CMAQ Emissions	Total CMAQ Project Reductions for CO, VOC, Nox, PM2.5 & PM10	N/A (MVRPC and Specific MPOs)	October 2018	VOC: 69 kg/day Nox: 537 kg/day
TRANSIT	Transit Asset Management Plan	Transit – Capital State of Good Repair	N/A	June 2017	For specific targets see: https://www.mvrpc.org/sites/default/files/transit_asset_management_2017.pdf
	Public Transportation Agency Safety Plan	Fatalities	N/A	May 2020	For specific targets see: https://www.mvrpc.org/sites/default/files/ptasp_targets_2020.pdf
		Injuries			
		Safety Events			
		System Reliability (State of Good Repair)			

Source: Greene CATS, GDRTA, MCTS, ODOT and MVRPC

performance relative to targets as part of periodic transportation planning reviews, including MPO certification reviews, and reviews of adopted LRTPs and TIPs.

Project Evaluation System Update

In 2019, and in preparation for the Long Range Transportation Plan update, MVRPC staff worked with a committee of 15 MPO members to conduct a major review and update the Project Evaluation System (PES). One of main goals of the PES update was to better align the criteria with the performance management approach and to improve the condition of regional transportation assets, particularly those in the National Highway System (NHS). As a result the PES now includes criteria addressing pavement and bridge conditions and additional points are given to major arterials on the NHS.

8.2 PM 1 Safety

The first of the performance measure rules issued by FHWA became effective on April 14, 2016, establishing five measures to assess the condition of road safety:

- Number of Fatalities.
- Rate of Fatalities: fatalities per million vehicle miles traveled (MVMT).
- Number of Serious Injuries.
- Rate of Serious Injuries: serious injuries per MVMT.
- Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries.

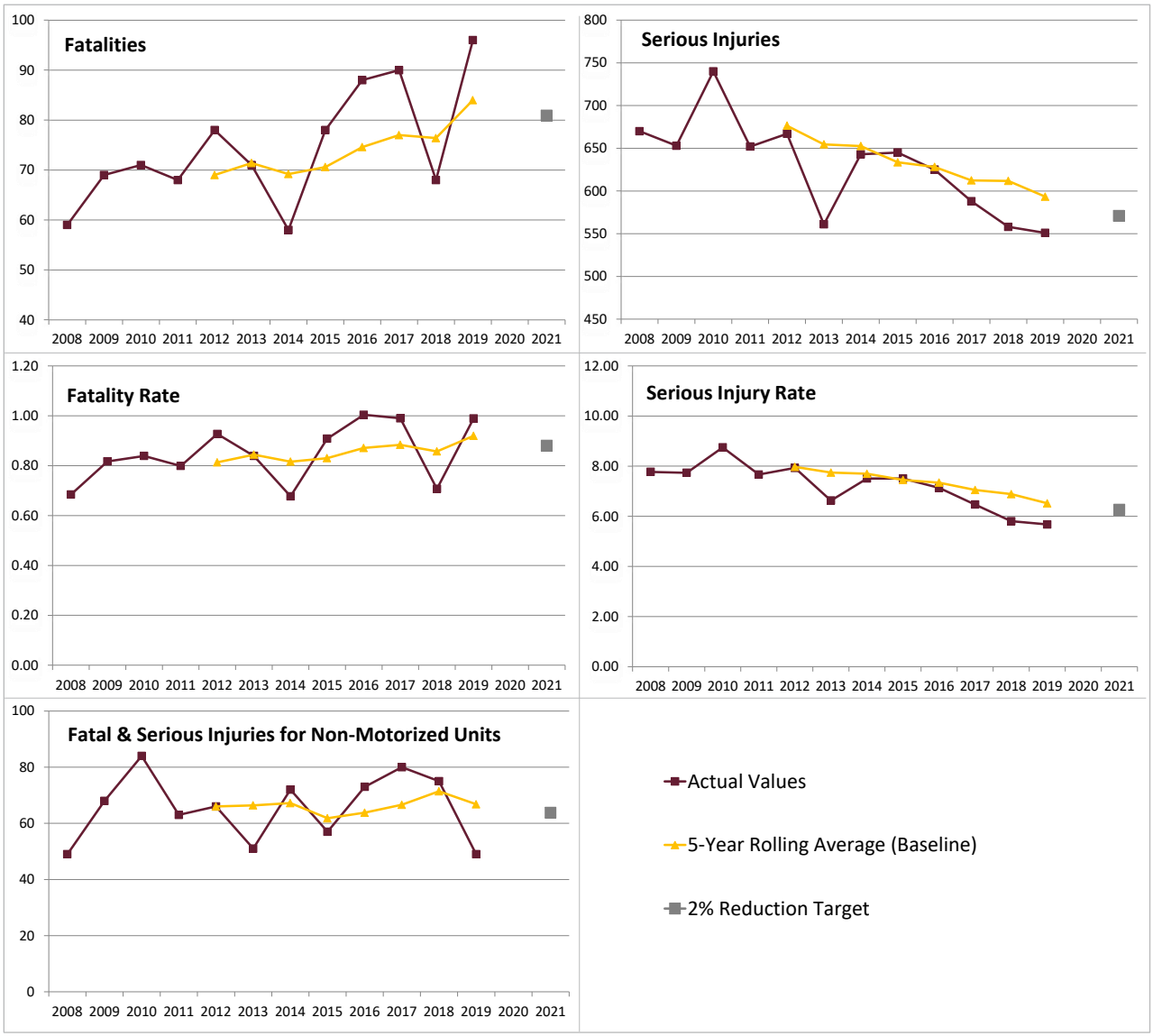
ODOT has established a 2% annual reduction goal for all five safety performance measures for 2021.

To date, MVRPC has supported all ODOT's safety performance targets. In November 2020, the MVRPC Board of Directors adopted a resolution to support ODOT's most recent 2% annual reduction goal for 2021 for all five performance measures. While a determination of progress is done at the state level only, Figure 8.2 shows the MPO safety trends and targets for 2021 assuming that MVRPC would have adopted a 2% annual reduction goal. Based on the preliminary data, MVRPC would have met three "targets for 2019" – number of serious injuries, serious injury rate, and the number of non-motorized fatalities and serious injuries.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

As per performance management requirements of the FAST Act, and in coordination with ODOT and the regional transit agencies, MVRPC staff analyzed the impact of pertinent SFY 2021-2024 TIP projects to help achieve adopted targets. There are 6 projects in the TIP that address a regional safety priority location. An additional 13 projects are expected to have a positive impact on safety. The total cost of safety improvement projects funded with STP, CMAQ, and TA funds is nearly $74 million. An additional 10 projects with a construction cost of $24.5 million are funded with ODOT HSIP funds.

Figure 8.2 — Summary of Safety Trends in the MVRPC MPO Region



Source: ODOT and MVRPC

Public Education Safety Campaigns

Recognizing that public education plays an important role in reducing crashes and making the Region's roads safer for all users, MVRPC develops safety materials and educational campaigns to encourage safe behavior and address trending/rising crash types or behaviors. Past materials and campaigns have included, Bike PSAs, Share the Road materials, Street Smart Campaign (aimed at pedestrian safety), seat belt usage, proper use of child restraints and distracted driving.

8.3 PM 2 Pavement and Bridge Conditions

The second of the performance measures rules issued by FHWA became effective on May 20, 2017, establishing measures to assess the condition of pavements and bridges on the National Highway System (NHS) that is further subdivided into the Interstate system and the non-Interstate NHS. States are required to establish 2-year and 4-year targets for PM2 measures over a four-year performance period. Two-year targets reflect the anticipated performance level at the midpoint of each performance period, while 4-year targets reflect it for the end of the performance period. MVRPC is only required to either establish or support ODOT's 4-year targets.

Pavement Conditions

There are four performance measures to evaluate pavement conditions on the NHS:

- Percentage of pavements on the Interstate system in *good* condition.
- Percentage of pavements on the Interstate system in *poor* condition.
- Percentage of pavements on the non-Interstate NHS in *good* condition.
- Percentage of pavements on the non-Interstate NHS in *poor* condition.

ODOT reviewed 8 years of HPMS submitted NHS pavement data to establish targets for the pavement condition performance measures. MVRPC has chosen to support ODOT's 4-year targets. The table in Figure 8.3 summarizes Ohio's 4-year targets and compares them against MVRPC's 2017 baseline computed values. Figure 8.3 shows that while the majority of the interstate pavements in the MVRPC MPO region are in good condition, a significant portion of the non-interstate NHS pavements (especially locally owned non-interstate NHS) are classified as being in either fair or poor condition. As a result, MVRPC meets three out of four of ODOT's pavement condition "targets"; it does not meet the 35% target established by ODOT for percentage of non-interstate NHS pavements in good condition.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

MVRPC does not have any Interstate System pavement condition projects that use STP, CMAQ, or TA funds. There are 10 projects using ODOT controlled funds that improve 139 lane-miles of Interstate with a construction cost of $67 million.

There are 4 projects in the SFY 2021-2024 TIP that address Non-Interstate NHS pavement conditions. The total cost of pavement condition projects funded with STP, CMAQ, or TA funds is $21.3 million. There is an additional 19 projects using ODOT controlled funds that improve Non-interstate NHS pavement conditions with a construction cost of $28.6 million.

Bridge Conditions

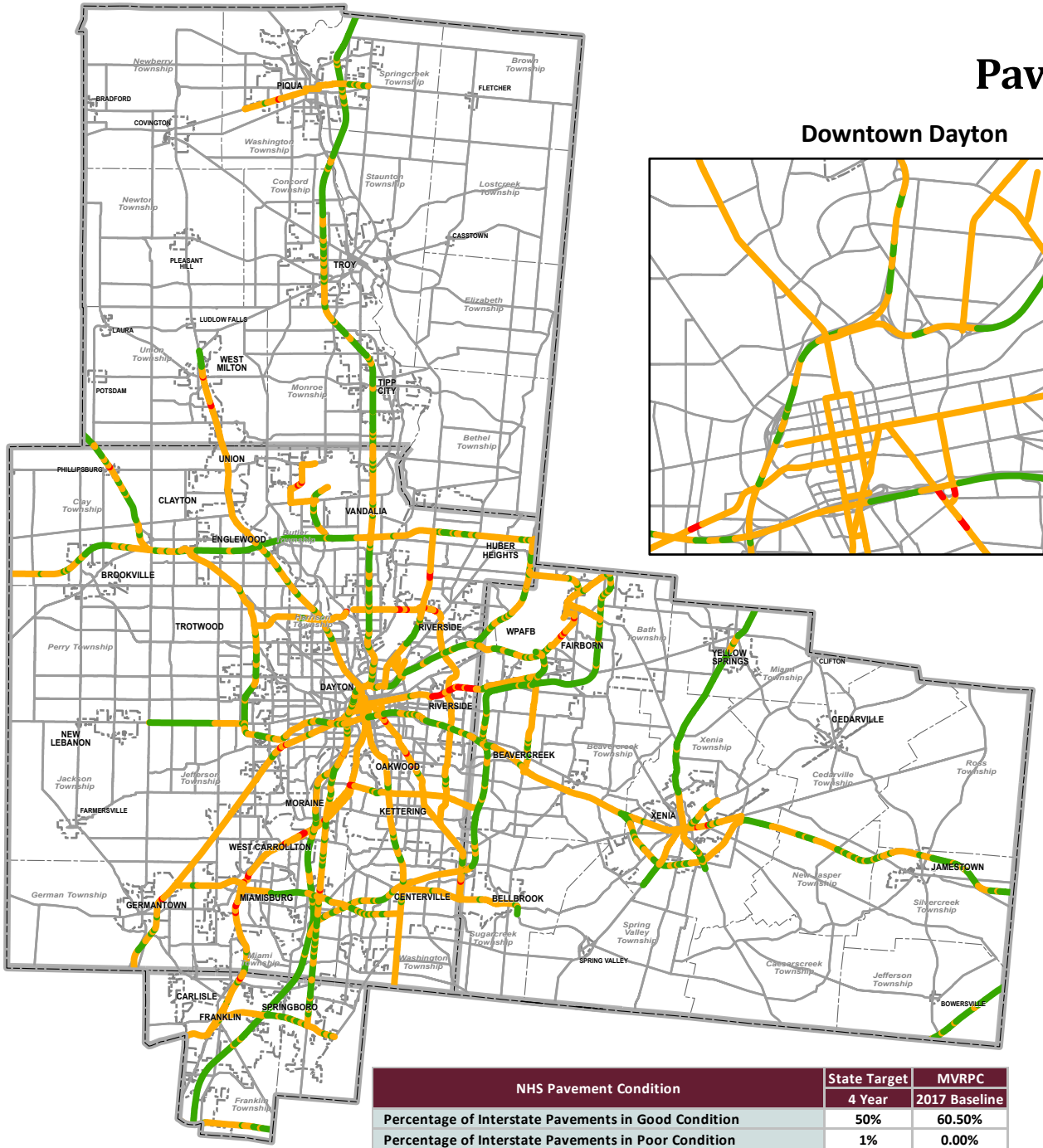
ODOT used the National Bridge Inventory (NBI) data to assess condition of bridges on the interstate and non-interstate NHS to establish targets against two performance measures:

- Percentage of bridges on the NHS in *good* condition.
- Percentage of bridges on the NHS in *poor* condition.

Figure 8.4 shows the NHS bridges in the MVRPC MPO region.

MVRPC

Figure 8.3
Pavement Conditions



NHS Pavement Condition	State Target 4 Year	MVRPC 2017 Baseline
Percentage of Interstate Pavements in Good Condition	50%	60.50%
Percentage of Interstate Pavements in Poor Condition	1%	0.00%
Percentage of Non-Interstate NHS Pavements in Good Condition	35%	23.60%
Percentage of Non-Interstate NHS Pavements in Poor Condition	3%	2.30%

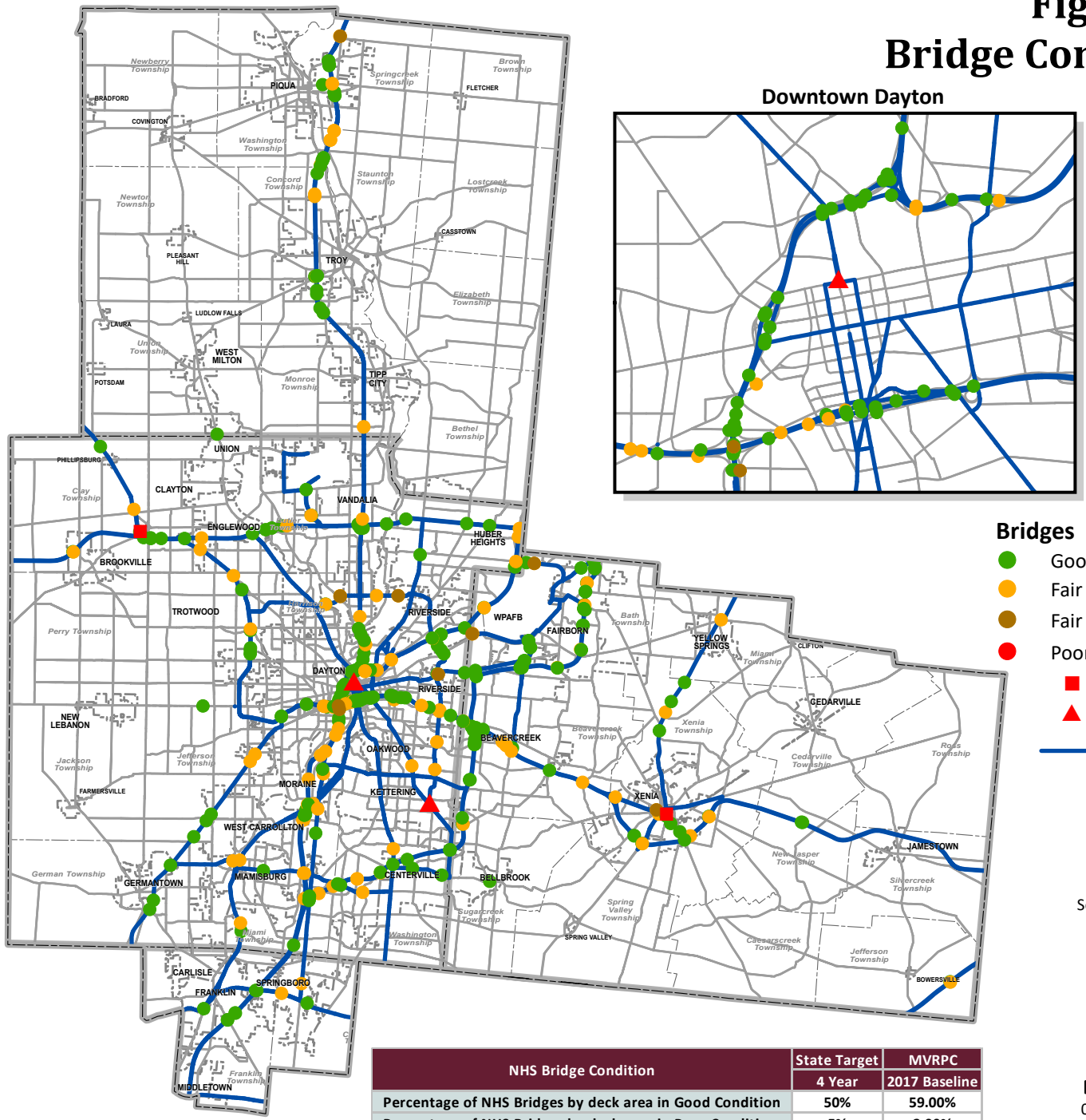
Source: ODOT and MVRPC, 2018

May 2021

N

0 2 4 6 8 Miles

Figure 8.4
Bridge Condition Ratings



NHS Bridge Condition	State Target	MVRPC
	4 Year	2017 Baseline
Percentage of NHS Bridges by deck area in Good Condition	50%	59.00%
Percentage of NHS Bridges by deck area in Poor Condition	5%	2.00%

The majority of the bridges can be classified as being in either good or fair condition. In 2018, four bridges were rated as being in poor condition. All four have since been addressed as TIP programmed projects or through reconstruction/replacement. MVRPC is supporting ODOT's 4-year targets for bridge condition measures and MVRPC's 2017 baselines shows that it met both those targets as shown in Figure 8.4.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

MVRPC does not have any NHS Bridge Condition projects that use STP, CMAQ, or TA funds. There are 228 bridges in the NHS that are being improved with ODOT controlled funds with a total construction cost of $54.7 million.

8.4 PM 3 System Performance

The third of the three performance measures rules issued by FHWA became effective on May, 20 2017, establishing measures to assess the performance of the NHS, freight movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program (CMAQ). States are required to establish 2-year and 4-year targets for PM 3 measures for a four-year performance period. MVRPC has chosen to support ODOT's 4-year targets for all applicable PM3 measures.

Travel Time Reliability on the NHS

FHWA established two performance measures to assess travel time reliability on the NHS:

- Percent of Person-Miles Traveled on the Interstate that are Reliable.
- Percent of Person-Miles Traveled on the non-Interstate NHS that are Reliable.

These measures seek to assess how reliable the NHS network is by calculating a ratio called the Level Of Travel Time Reliability (LOTTR). The data to compute LOTTR is sourced from FHWA's National Performance Management Research Data Set (NPMRDS). Ohio MPOs are able to access the computed metrics for their region through an ODOT subscription to a toolset provided by a private contractor that assists in calculating these metrics for the NHS. The top graph in Figure 8.5 shows the trend lines for the auto travel time reliability measures on the Interstate and non-Interstate NHS in the MVRPC Region. Based on the 2017 baseline values[4], MVRPC would meet both of the 4-year targets as established by ODOT and summarized in Table 8.1.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

At this time MVRPC does not have any Interstate System NHS Travel Time Reliability projects that use STP, CMAQ, or TA funds. There are no Interstate System travel time reliability projects using ODOT controlled funds either. There is 1 project funded with STP, CMAQ, or TA funds that addresses NHS Non-Interstate Travel Time Reliability with a total cost of $3.3 million. There is 1 additional project funded with ODOT funds that addresses NHS Non-Interstate Travel Time Reliability with a construction cost of $9.7 million.

[4] The data for auto travel time reliability on the interstate shows an acceptable trend while that for the non-Interstate NHS shows an unexplained increase from 2017 to 2018. However, in the absence of other data alternatives to evaluate travel time reliability, MVRPC continued to use the existing data to study regional trends.

Freight Travel Time Reliability on the Interstate System

FHWA established the following freight reliability performance measure:

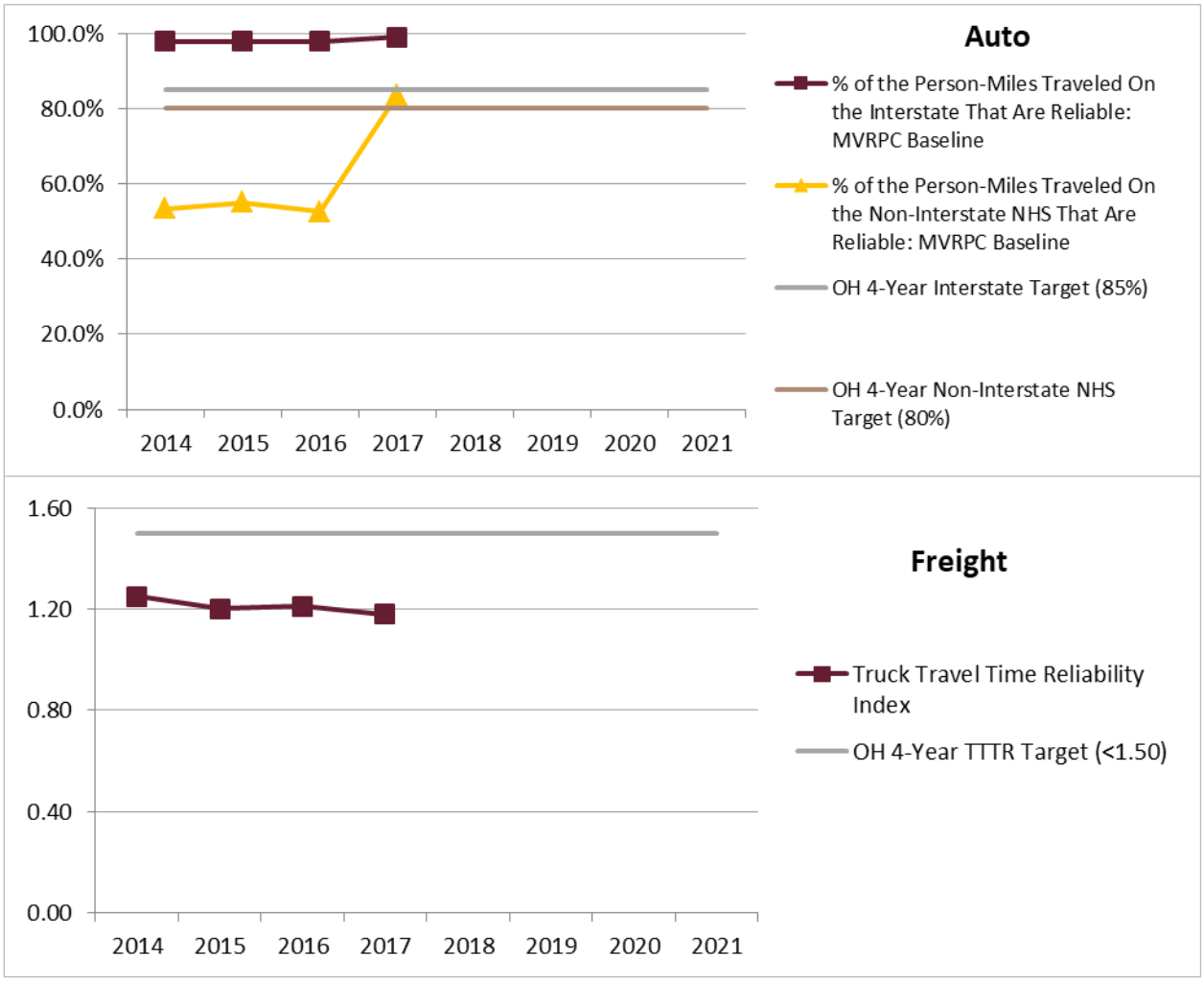
- Truck Travel Time Reliability (TTTR) Index.

This measure seeks to assess how reliable the interstate network is for trucks by calculating a ratio called TTTR. Similar to the computation of LOTTR, the data to compute TTTR is also sourced from the NPMRDS. The bottom graph in Figure 8.5 shows the trend lines for the TTTR Index on the Interstate system in the MVRPC Region. Based on the 2017 baseline value of 1.18, MVRPC would meet the 4-year target as established by ODOT (<1.50 TTTR Index).

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

At this time MVRPC does not have any Interstate System Freight projects that use STP, CMAQ, or TA funds. There is no Interstate System Freight projects using ODOT controlled funds either.

Figure 8.5 — Travel Time Reliability: MVRPC Regional Trends



Source: FHWA, ODOT and MVRPC

CMAQ Program

The PM3 rule also contains performance measures to assess the Congestion Mitigation and Air Quality Improvement (CMAQ) program through measurement of total emissions reduction of on-road mobile source emissions. States whose geographic boundaries include any part of a nonattainment or maintenance area for ozone, carbon monoxide, or particulate matter need to establish targets for each of these applicable criteria pollutants and precursors. Since Warren County is designated as non-attainment for 8-hour ozone (2015), MVRPC is required to either establish targets or support ODOT's targets for VOC and NOx.

ODOT established emissions reduction targets in 2018 for three mobile-source pollutants (VOC, NOx and PM2.5) based on 2013-2016 project emissions data recorded in FHWA's CMAQ Public Access Database. MVRPC is supporting the applicable 4-year VOC and NOx targets as established by ODOT and summarized in Table 8.1.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

There are 17 projects in the SFY2021-2024 TIP that address CMAQ Emission reductions for our region. The total cost of MPO funded CMAQ emissions reduction projects is nearly $31 million.

8.5 Transit Asset Management

FTA's Transit Asset Management (TAM) rule became effective on October 1, 2016. This rule applies to all recipients and subrecipients of federal transit funding that own, operate, or manage public transportation capital assets. The purpose of the TAM is to help achieve and maintain a state of good repair (SGR) for the nation's public transportation assets. It requires transit agencies to establish a system to monitor and manage public transportation assets to improve safety and increase reliability and performance, and to establish performance targets for four national performance measures:

- Rolling Stock: % of vehicles that have met or exceeded their Useful Life Benchmark (ULB).
- Equipment: % of vehicles that have met or exceeded their ULB.
- Infrastructure: % of track segments with performance restriction.
- Facilities: % of facilities in an asset class, rated <3 on the Transit Economic Requirements Model (TERM) scale.

In coordination with ODOT's Office of Transit and the three regional transit agencies, GDRTA, Greene CATS Public Transit, and Miami County Transit System, the MVRPC Board of Directors adopted a resolution in June 2017 in support of the targets established in the TAM Plan. A summary of the initial targets established by each transit agency by asset class in relation to a 2017 baseline can be viewed on the MVRPC website at: https://www.mvrpc.org/sites/default/files/transit_asset_management_2017.pdf.

Section 5310 Transit Asset Management Plan

MVRPC is the Designated Recipient for FTA Section 5310 funds (See Chapter 6 for more information about the program) and is therefore the Sponsor Agency for the various Tier II agencies that have received and operated 5310 funded vehicles. The group plan sponsor is responsible for setting unified targets for the

plan participants. Tier II providers may only participate in one group plan and must provide written notification to MVRPC if they choose to opt-out and develop their own plan. Greater Dayton RTA, Greene CATS Public Transit, and Miami County Transit System have all opted to develop their own plans.

MVRPC has developed this regional Transit Asset Management (TAM) Group Plan in accordance with the guidelines established by the FTA. Specifically, CFR 625.25 requires that all TAM plans include:

- An inventory of the number and type of capital assets.
- A condition assessment of those inventoried assets for which a provider has direct capital responsibility.
- A description of analytical processes or decision-support tools used to estimate capital investment needs over time.
- A project-based prioritization of investments.

Following the above process, MVRPC developed 2 targets following FTA guidance based on 2018 baseline inventory data: Useful Life Benchmark (USB) and State of Good Repair (SGR). Two separate targets were chosen because while many vehicles exceed their FTA recommended life benchmarks due to low mileage and good maintenance practices, the vehicles are generally within a state of good repair. Table 8.2 shows those targets. The Transit Asset Management Plan and Targets were adopted by the MVRPC Board of Directors at its October 4th, 2018 meeting.

Table 8.2 — Section 5310 Transit Asset Management Plan Targets

Measure	2018 Baseline	2019 Targets
Useful Life Benchmark	51 %	No more than **45 %** of vehicles exceed their useful life
State of Good Repair	33 %	No more than **25 %** of vehicles have an SGR < 2.5

Source: MVRPC

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

There are 39 projects in the TIP that address transit assets. The total cost of transit asset projects funded in the SFY 2021-2024 TIP is $148 million.

8.6 Public Transportation Agency Safety Plans

In July 2018, FTA published the Public Transit Agency Safety Plan (PTASP) Final Rule, which requires certain operators of public transportation systems that receive federal funds under FTA's Urbanized Area Formula Grants and all rail transit systems to develop safety plans that include the processes and procedures to implement Safety Management Systems (SMS). Its purpose is to improve public transportation safety by guiding transit agencies to more effectively and proactively manage safety risks in their systems. Transit agencies are required to set performance targets for each of the performance measures as identified in the most recent National Public Transportation Safety Plan (NSP):

- System reliability: mean distance between major mechanical failures.
- Safety events: number and rate per total vehicle revenue miles by mode.
- Fatalities: number and rate per total vehicle revenue miles by mode.
- Injuries: number and rate per total vehicle revenue miles by mode.

In coordination with ODOT's Office of Transit and the three regional transit agencies, GDRTA, Greene CATS Public Transit, and Miami County Transit System, the MVRPC Board of Directors adopted a resolution in May 2020 in support of the public transportation safety targets established by each regional transit agency by mode in relation to a historical baseline. A summary of the public transportation safety targets can be viewed on the MVRPC website at: https://www.mvrpc.org/sites/default/files/ptasp_targets_2020.pdf.

Impact of Projects in the SFY 2021-2024 Transportation Improvement Program

There are 35 projects in the SFY 2021-2024 TIP that address transit system reliability. The total cost of these projects in the TIP is $129 million. Fatalities, injuries, and safety events are addressed by each transit agency, through policies, risk management practices, safety assurances and promotion including but not limited to: communications, reporting, hazard identification, and training programs.

8.7 Regional Report Card

In addition to the federal performance measures described in the previous sections, MVRPC researches and tracks other regional transportation measures related to system performance, safety, transportation system conditions, and accessibility to gain insight into how well the transportation system is doing and what areas need improvement. It also expands the geographic scope beyond the federal requirements (for example, considering all functionally classified roads versus roads in the NHS only) and provides an indication of future needs. These trends are published in a **Regional Report Card**.

The Regional Report Card is shown in Table 8.3. It documents and describes the various measures that are tracked under each category, the data source used to evaluate the measures, two historical data points for comparison, and a trend analysis based on this historical comparison. The trend analysis shows the goal for that measure (for example, the Region would like to see a downward trend for the number of fatalities) against the actual performance. All measures where the actual performance is worse than the desired trend are identified by shading the table cell red.

Table 8.3 — Regional Report Card

Measure		Description	Data		Goal	Actual	Trend
System Performance	Average Freeway Speed (mph)	Source: INRIX	60.2 (2013)	63.1 (2018)	—	↑	4.8%
	Congested System	Congested Lane-MIles Source: Texas Transportation Institute (TTI)	24.0% (2011)	8.4% (2017)[1]	↓	NA	■
	Annual Freeway Vehicle Hours of	In hours; Source: INRIX	696,167 (2013)	844,980 (2018)	↓	↑	21.4%
	Annual Cost of Vehicle Delay on	In millions; Source: INRIX	$24.33 (2013)	$30.14 (2018)	↓	↑	23.9%
	Annual Cost of Truck Delay on Freeways	In millions; Source: INRIX	$12.82 (2013)	$14.44 (2018)	↓	↑	12.6%
Safety	Incident Response	Average duration of major freeway incidents In minutes; Source: INRIX	98 (2013)	101 (2018)	↓	—	■
	Mean Distance Between Calls	Miles between service calls Source: GDRTA	15,813 (2013)	26,831 (2018)	↑	↑	69.7%
	Rate of Fatalities	Total fatalities per 100 million Daily VMT Source: ODPS	0.88 (2011-	0.89 (2014-16)	↓	↑	1.0%
	Rate of Serious Injuries	Total incapacitating injuries per 100 MDVMT Source: ODPS	7.88 (2011-	7.57 (2014-16)	↓	↓	-3.9%
	Transit Incidents	Transit incidents per 100,000 trips Source: NTD	0.27 (2011-	0.47 (2016-	↓	↑	74.0%
	Bike/Pedestrian Safety	Number of Nonmotorized Fatalities and Serious Injuries	852.8 (2013-	858.4 (2014-17)	↓	↑	0.7%
System Conditions	Pavement Condition Rating (PCR)	% Road Mileage in Poor Condition based on PCR	2.8% (2015)	4.3% (2018)	↓	↑	53.6%
	Bridge Rating	% of Bridges in Fair / Poor Condition Source: ODOT	12.7% (2014)	13.4% (2018)	↓	↑	5.5%
Accessibility	Miles of Regional Bikeway	Additions to Regional Bikeway System In miles; Source: MVRPC	198 (2014)	220 (2018)	↑	↑	11.0%
	Population Served by Bikeway	Population within ½ mile of a Regional Bikeway	28.8% (2010)	32.3% (2018)	↑	↑	3.5%
	Employment Served by Bikeway	Employment within ½ mile of a Regional Bikeway	43.8% (2010)	46.8% (2018)	↑	↑	3.0%
	Population Served by Transit	Population within ½ mile of a GDRTA Bus Route	79.5% (2010)	83.0% (2018)	↑	↑	3.5%
	Employment Served	Employment within ½ mile of a GDRTA Bus	89.3%	89.5%	↑	—	■
	Work trips by Biking	Work trips in the Region by biking and walking	2.79%	2.58%	↑	—	■
	Population Living in Mixed Land Use	Population living in districts integrated with residential and employment land uses	26.5% (2010)	NA	↑	—	■

[1] The previous and current data points cannot be compared because TTI changed the methodology for computing congested lane-miles.
[2] Additional incidents included in 2018 data based on reporting of smaller incidents.
[3] Using 2010 population and employment and 2010 or 2018 transit/bike routes.

CHAPTER 9

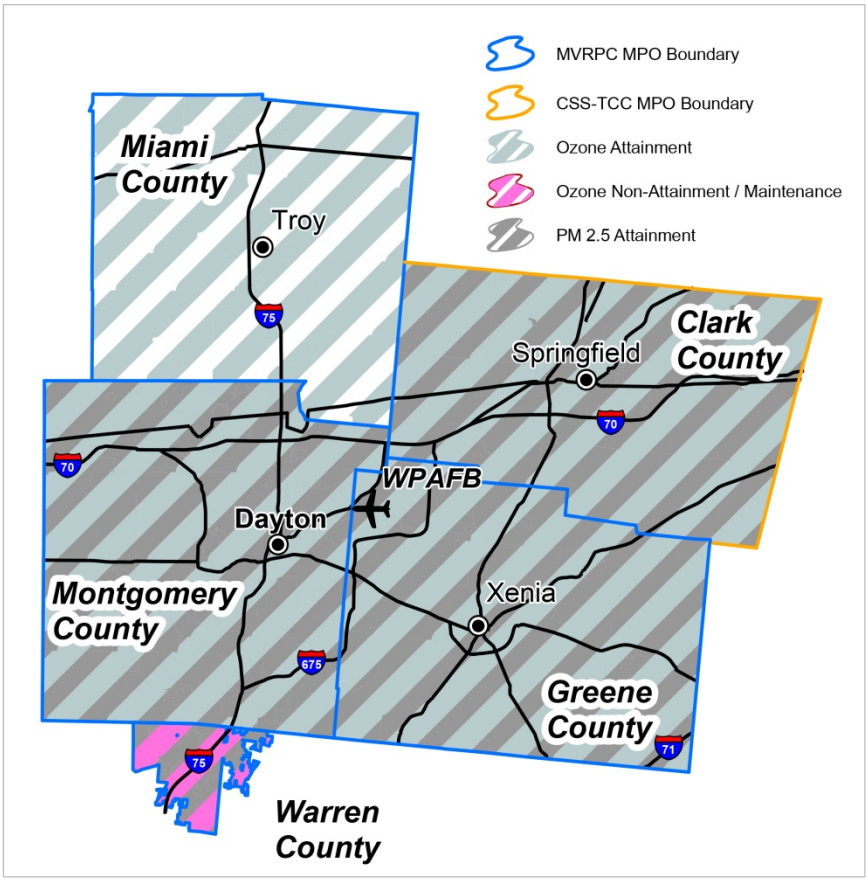
ENVIRONMENTAL PLANNING

9.1 Air Quality Planning

Background

MVRPC is comprised of the counties of Greene, Miami, and Montgomery as well as the Cities of Franklin, Carlisle, and Springboro, and Franklin Township in northern Warren County. Warren County is located in the Cincinnati air quality Region (Cincinnati Region), with the remainder counties in the MPO located in the Dayton/Springfield air quality Region (D/S Region). The D/S Region also includes Clark County, which is represented by a different MPO, the Clark County Springfield Transportation Coordinating Committee (CCSTCC). Due to multiple air quality regions and MPOs, conformity is closely coordinated with neighboring organizations, with MVRPC being the lead agency in the D/S Region and the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) being the lead agency in the Cincinnati Region. Figure 9.1 illustrates this complex situation.

Figure 9.1 — Air Quality Standards Designations



MVRPC conducts transportation conformity in accordance with the Clean Air Act Amendments of 1990 which expanded transportation's role in contributing to national clean air goals. The 1990 amendments expanded the definition of "transportation conformity" to:

> Conformity to the (air quality implementation) plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not (i) cause or contribute to any new violations of any standards in any area, (ii) increase the frequency or severity of any existing violation of any standard in any areas, or (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

9.2 Air Quality Standards

Ozone Standard

In April 2004, the United States Environmental Protection Agency (U.S. EPA) issued final designations regarding the 1997 8-hour ozone standard. The 1997 8-hour standard is violated when the 3-year average of the annual fourth highest daily maximum 8-hour ozone average concentration exceeds 0.08 ppm (parts per million). All four counties (Clark, Greene, Miami, and Montgomery) in the Dayton/Springfield Region (D/S Region) and Warren County in the Cincinnati Region were designated as basic non-attainment for ozone. The D/S Region was designated to attainment/maintenance for 1997 ozone in August 2007 and the Cincinnati Region was designated to attainment/maintenance for 1997 ozone in May 2010. The Cincinnati Region is also designated as maintenance for the 2008 ozone standard and non-attainment for 2015 ozone.

On March 6, 2015, U.S. EPA published the final rule for the Implementation of the 2008 NAAQS for Ozone: State Implementation Plan Requirements, 80 FR 12264, effective April 6, 2015. The final rule revoked the 1997 ozone standard for all purposes including transportation conformity but on February 16, 2018, the U.S. Court of Appeals for the District of Columbia Circuit on the South Coast II Court Case held that transportation conformity determinations must continue to be made in those areas ("orphan areas"). As an ozone orphan area and consistent with U.S. EPA's November 29, 2018 guidance and interagency consultation, MVRPC will advance a qualitative Long Range Transportation Plan (LRTP) conformity determination for the Dayton/Springfield Region as documented in Table 9.1.

Table 9.1 — MVRPC Transportation Conformity Requirements

Requirements	Documentation
Latest planning assumptions:	• MVRPC maintains a travel demand model with current socio-economic variables and highway/transit networks used to develop the LRTP. For the 2050 update both the socio-economic data and networks have been updated to 2050.
Consultation:	• Interagency consultation was conducted in January 2021, documentation can be found in Appendix A. • Consistent with MVRPC's Public Participation Policy, several public participation meetings were conducted throughout the update period with the final meeting being held on April 14, 2021. Due to the Covid-19 pandemic all meetings were conducted virtually. Chapter 11 provides a summary of the public participation efforts.
Transportation Control Measures (TCMs):	• There are no TCMs in the Dayton/Springfield air quality Region State Implementation Plan (SIP).
Fiscal Constraint:	• All non-exempt projects in the MVRPC region are included in 2050 LRTP and TIP (if within the TIP years SFY2021-2024). Costs for these projects are included in the fiscal constraint analysis for the respective documents.

Table 9.2, prepared by the Ohio Kentucky Indiana Regional Council of Governments, shows that the Ohio portion of the Cincinnati non-attainment area demonstrates conformity to the 8-hour ozone standards of the State Implementation Plan (SIP). Technical details of the analysis and additional documentation can be found at https://2050.oki.org/wp-content/uploads/2020/08/Conformity-Technical-Document_Amended-2050-Plan.pdf.

Table 9.2 — Quantitative Conformity Findings of Ozone-forming Emissions (tons per day) for the Ohio and Indiana Portion* of the Non-Attainment/Maintenance Area

Budget/Emissions	2020	2030	2040	2050
Ohio/Indiana VOC Budget	30.00	18.22	18.22	18.22
Ohio/Indiana VOC Emissions	15.81	7.68	5.59	5.27
Ohio/Indiana NO_x Budget	30.79	16.22	16.22	16.22
Ohio/Indiana NO_x Emissions	22.99	8.57	5.62	5.61

*Includes Clinton County in Ohio and Lawrenceburg Twp., Dearborn County in Indiana

Fine Particulate Standard

In December 2004, the U.S. EPA issued air quality designations regarding the 1997 fine particulate (or PM 2.5) standard. The Clark, Greene, Montgomery, and Warren Counties were designated non-attainment for the annual PM 2.5 standard. The annual standard is exceeded if the 3-year average of annual mean PM 2.5 concentrations is greater than 15 micrograms per cubic meter. The D/S Region was re-designated to

attainment/maintenance for PM 2.5 on September 26, 2013 and the Cincinnati Region was designated to attainment/maintenance for PM 2.5 in 2011. In August 24, 2016, U.S. EPA published the final rule for the Implementation of the Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, 81 FR 58010, effective October 24, 2016. The final rule revokes the 1997 PM 2.5 standard for all purposes including transportation conformity.

With the revocation of the PM 2.5 standard, areas that have already been re-designated to attainment no longer have to demonstrate conformity.

9.3 Climate Change

Climate change is a global phenomenon which has been observed over the past several decades and is projected to continue into the foreseeable future. The driving characteristic of climate change is a global increase in temperatures, which creates changes in weather patterns around the globe. Different parts of the globe will experience different aspects of these changes, from severe drought and wildfires in some areas to flooding due to rising tides in others. The Miami Valley has its own set of challenges, attributable to the global change in climate, that are being or will be experienced.

Climate change is driven by an increased concentration of water vapor and other greenhouse gases (e.g. carbon dioxide and methane) in the atmosphere. These gases absorb energy, locking heat onto the Earth that would normally escape into space. As more heat is trapped, glaciers and ice caps shrink, which adds more water into the oceans, as well as increasing the amount of water evaporating into the atmosphere. In this manner, the heat-trapping effect reinforces itself. Other greenhouse gases are added by natural processes (e.g. volcanic eruption), as well as activities like farming and burning fossil fuels. Currently, fuel burnt for transportation accounts for 28% of greenhouse gas emissions in the United States, making transportation the top source of such emissions.[5]

It is also important to distinguish between climate and weather; climate is a long-term average of weather over a specified area, whereas weather is a description of circumstances at a particular time. So, for example, while the global climate may be getting warmer, a particular region may experience an increased number of extreme cold events. Thus a geographic locale experiencing record or near-record low temperatures with heightened frequency (for example), does not indicate a cooling in the global climate's trajectory. It may be a symptom of the planet getting warmer overall.

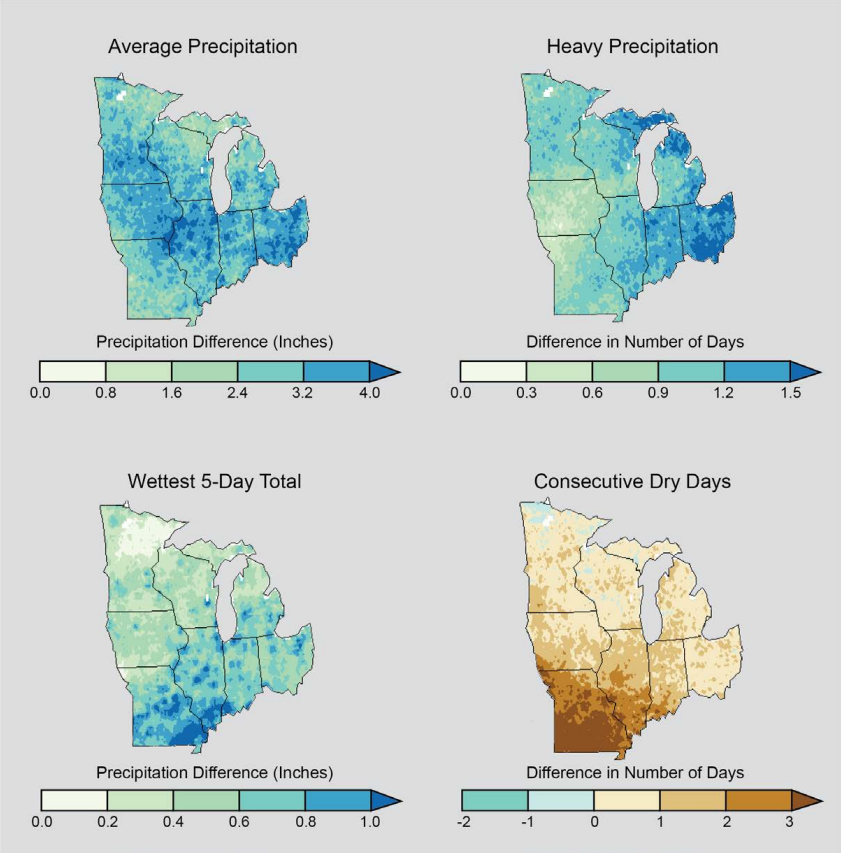
What is Happening in the Miami Valley

In the Miami Valley Region, we have seen a significant increase in precipitation, and models predict this trend will continue (see Figure 9.2). In fact, while more precipitation is predicted by climate models, it is also predicted to occur over fewer days of precipitation. This means more frequent flooding of roads, culverts, and bridges/bridge approaches; with each flood event having the potential to disrupt the ability to

[5] EPA 2020. "Inventory on Greenhouse Gas Emissions and Sinks: 1990-2018." *U.S. Environmental Protection Agency*, Washington, D.C. April 2020. *EPA-430-R-20-002* (2020). Sec. 2 Pg. 25

travel and the need to reroute around the flooding. In the long term, more frequent flooding can lead to erosion of the soil which supports roads and bridges, thus shortening the lifespan of infrastructure.[6] Regional bike trails, many of which are built along waterways, are also likely to be submerged more frequently and for extended periods of time.

Figure 9.2 — Projected changes for 2041-2070, relative to the averages from 1941-1970[7]



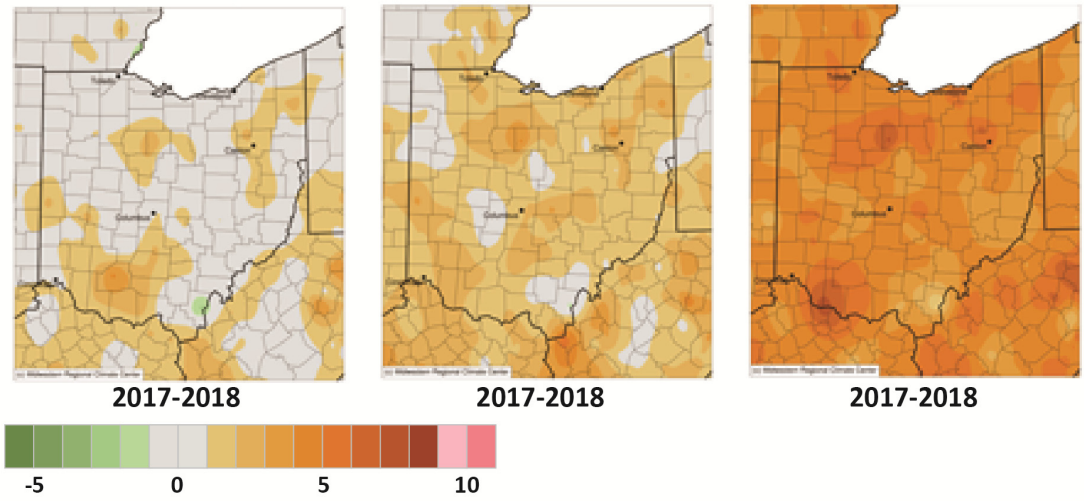
As there become fewer (but heavier) precipitation days, there are also projected to be more dry days. While the abundance of natural water in Ohio and the Midwest (especially the Great Lakes) prevents the threat of drought on the level of more arid climates like in the Southwest, many consecutive days with little or no precipitation can cause problems. When soil is dried, it becomes less permeable, so less precipitation is needed to cause flood conditions and a heavy precipitation event will cause more flooding than usual. Thus the issues outlined above for heavier precipitation events are exacerbated by drought. These events can further breakdown the soil's ability to absorb water in the future, snowballing damage further. [6]

There are mixed projections concerning winter weather in the Region. The overall trend predicted by models is warmer winters, as we have seen in recent years (see Figure 9.3), but there is also evidence that

[6] ODOT 2016. "Ohio DOT Infrastructure Resiliency Plan." Ohio Department of Transportation, Columbus, OH May 2016.
[7] NCA 2014. "Climate Change Impacts in the United States: The Third National Climate Assessment." U.S. Global Change Research Program (USGCRP), Washington, D.C. 2014.

the jet stream is slowing and becoming wavier as the planet warms.[8] A wavy jet stream would have an effect on arctic oscillation, increasing the frequency of events when the polar vortex drops south into the Midwest, as happened in early January 2014 and late January 2019. Such events bring extreme cold. Projections of warmer winters overall and increasing bouts of extreme cold are not inconsistent, but together they amount to a prediction of erratic winter temperatures, likely to produce (near-)record highs and (near-)record lows.

Figure 9.3 — Average daily maximum temperature change, December-February, relative to the average from 1981-2010[9]



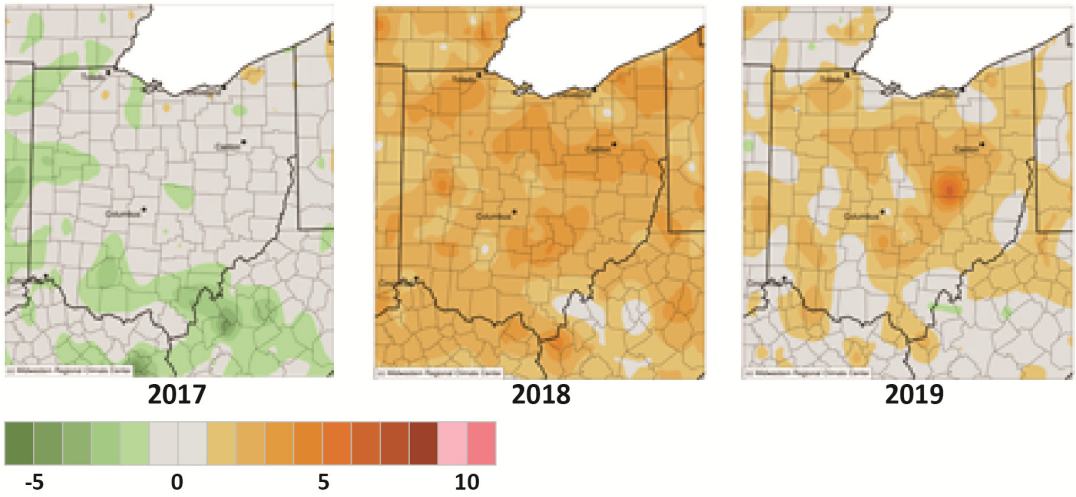
Warmer winters would indicate a decrease in snow and ice accumulation. This may increase the life of infrastructure, owing to less corrosion from salt treatment. However, a winter with more days for which the high temperature is above freezing is more likely to result in more frequent freeze-thaw cycles; this is destructive to road and bridge surfaces and creates potholes.[6]

Increasing average summer temperatures and extreme heat events can cause expansion of bridge joints and buckling of pavement, thus shortening the life of infrastructure. High temperatures also worsen air quality, creating a public health concern. The impact of poor air quality is especially acute for those with preexisting respiratory conditions (e.g. asthma and COPD) and the elderly. Summer 2019 was the hottest on record in the northern hemisphere. In Ohio, summer 2018 was hotter, due in large part to higher-than-average daily low temperatures (see Figure 9.4). The trend of warmer summers is projected to continue.

[8] NOAA 2014. "How Is the Polar Vortex Related to the Arctic Oscillation?" How is the polar vortex related to the Arctic Oscillation? National Oceanic and Atmospheric Administration (NOAA), January 20, 2014. https://www.climate.gov/news-features/event-tracker/how-polar-vortex-related-arctic-oscillation.

[9] MWRCC 2020, cli-MATE Interpolated Station Data online tool. Midwest Regional Climate Center (MRCC), Accessed May 12, 2020. https://mrcc.illinois.edu/CLIMATE/.

Figure 9.4 — Average daily minimum temperature change, June-August, relative to the average from 1981-2010[9]



One question of significance to the Region, due to the Memorial Day 2019 Tornado, which cannot be yet answered is whether climate change is responsible for a recent increase in the frequency of tornados, or whether climate change will result in further increases in the future. Scientists are not yet confident enough to answer these questions one way or another.[10] While we must settle for now on keeping the question open, it would be prudent to plan for the worst and hope for the best, while keeping up with the latest information. MVRPC has been leading the long-term recovery effort for communities affected by the Tornado.

Mitigation and Adaptation

While climate change has been occurring for decades, it is still possible to slow its rate and avoid the worst outcomes.[11] As fuel burned for transportation is one of the largest sources of greenhouse gases, changes in the way people and goods are transported could significantly reduce the rate at which heat-trapping gases enter the atmosphere.[7] Commuters traveling by walking, biking, and public transportation contribute significantly fewer greenhouse gas emissions than those traveling with combustion engine automobiles. The switch to electric vehicles for both commuters and freight is another significant way to reduce emissions. Replacing long-haul trucking and air freight with rail and river transportation, when possible, can also substantially reduce emissions.

[10] PNAS 2018. Ornes S. "Core Concept: How does climate change influence extreme weather? Impact attribution research seeks answers." National Academy of Sciences of the United States of America (PNAS), 115(33), 8232–8235. August 14, 2018. https://doi.org/10.1073/pnas.1811393115

[11] IPCC 2014. "Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change." [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. Intergovernmental Panel on Climate Change (IPCC), Geneva, Switzerland. November 2, 2014. Pgs. 17-26

Slowing the growth rate of impervious surfaces is a more localized and immediate way to reduce damage from climate change in the Region.[12] Maximizing the efficiency of drainage is the best way to avoid and reduce damage caused by flooding. Preserving open space & forests and utilizing pervious pavements and other infrastructure features that promote rapid drainage are strategies that can be used to mitigate the threat posed by flooding.[13]

Developing resiliency plans for handling the fallout of major weather events is an important way to reduce the economic, social, and health costs posed by these disasters.[6] Identifying evacuation routes helps people escape disaster areas quickly and safely, factoring things in such as which areas are flood-prone at varying levels of precipitation and flood stages. Having planned alternative routes can make an impacted transportation network function more smoothly. While it is impossible to predict where tornados will occur, pre-assigning responsibilities, planning communications, and deciding upon logistics for handling network breakdowns on critical arterials can make response faster and more effective.

While budgets are always thin, it is necessary to consider that many of the effects of climate change will require an increasingly greater allocation of funds to manage and respond. Inspections are likely to be needed more frequently with the threats of erosion from flood events and heat, tornado, or wind damage. Annual needs for salt and other ice treatments should be expected to be less predictable, including funding allocations, storage considerations, and potential issues with the supply chain. And pothole filling and resurfacing should be expected to be required more frequently, due to a greater number of freeze-thaw cycles. Staying on top of these needs saves money and lives in the long run.

ODOT, U.S. DOT, OEPA, the U.S. EPA, and other state and federal agencies are actively monitoring climate change data and are positioned to provide guidance and assistance for encountering related challenges. Coordinating with these and other agencies and staying abreast of the latest data and opportunities is a valuable strategy for mitigating and adapting to this evolving situation. From learning best practices to being positioned to quickly apply for and receive emergency funding, it is recommended to follow any related information given and actions taken by these agencies.

[12] USGS 2003. "Effects of Urban Development on Floods," Fact Sheet 076-03. United States Geological Survey (USGS), Water Resources. Tacoma, WA. November, 2003.
[13] USGS 2012. "Strategies for Managing the Effects of Urband Development on Streams," Circular 1378. United States Geoogical Survey (USGS). Reston, VA. 2012. Pgs. 18-19

9.4 Environmental Mitigation in SAFETEA-LU/FAST Act

> The final metropolitan transportation planning rules state that "metropolitan transportation plans shall include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the metropolitan T-Plan. Discussion may focus on policies, programs, or strategies. The discussion shall be developed in consultation with Federal, State, and Tribal land management, wildlife, and regulatory agencies."

Using guidance and databases from ODOT Environmental Services (OES) as a starting point, MVRPC analyzed the Long Range Transportation Plan projects for potential environmental impacts using GIS overlay techniques. When available, OES databases were enhanced with local or internal data sources. Mitigation techniques for various types of environmental effects are also discussed along with any applicable local mitigation resources.

Process Overview

Identification of possible projects with impacts to environmental resources began with the congestion management projects in the 2050 Long Range Transportation Plan. These projects were classified into two categories: Significant Projects and Non-Significant Projects. Projects were classified as "Significant" if, by virtue of their implementation/construction, there was a probability of potential impacts to the Region's natural resources. Such projects were typically capacity projects such as road widening, lane additions, and interchange addition/modification projects. Projects were classified as "Not Significant" if their implementation was unlikely to result in major impacts to the Region's environmental resources. These projects were typically non-capacity adding intersection improvement projects such as the addition of a turn lane and/or signal coordination projects.

Based on the above classification, potential environmental impacts were only determined for the significant projects. A few of the significant projects are already included in MVRPC's current Transportation Improvement Program (TIP) and have environmental documentation in place. These were excluded from the list of analyzed projects since their environmental effects are already well-documented. Figure 9.5 shows projects classified according to their potential environmental impact.

In 2019, MVRPC undertook a major effort to update old regional GIS databases with the latest available datasets for several environmental resources: cultural, historic and archaeological resources; wetlands, rivers and streams; total maximum daily load plans; threatened and endangered species habitats; superfund sites; and parklands. MVRPC staff was able to procure updated information for most of these environmental resources except threatened and endangered species habitats owing to the sensitive and confidential nature of that data. Thus, a separate map was created using GIS for each of the Region's environmental resources except threatened and endangered species habitats, that are displayed separately by county in a matrix format.

The remaining significant projects were evaluated for potential environmental impacts by overlaying them on various environmental resource maps using GIS. Projects in direct conflict with the Region's wetlands,

parklands etc. were identified as potentially affecting these environmental resources and displayed on maps, along with the plant and animal threatened and endangered species habitats by county matrices, in Figure 9.6 and Table 9.4 respectively.

Table 9.3 describes mitigation guidelines and strategies designed to address potential project impacts to environmental resources. Though not resources per se, this includes superfund sites, and those which are on the National Priorities List are described in Table 9.5 in more detail. Since the projects were evaluated for impacts at a macro level rather than determining specific impacts, the mitigation strategies encompass a menu of options to address a wide-range of potential impacts and are not project-specific. Detailed assessment of individual projects in future stages of project development may emphasize the importance of certain mitigation efforts, where needed, while rendering others redundant. It is the policy of MVRPC to require that all federally funded projects comply with applicable environmental statutes as a condition to receiving funding. The table also lists agencies with which to coordinate and consult on conservation of the resources.

Finally, a discussion on the various locally available mitigation resources and locally functioning environmental conservation organizations is provided at the end of this section. These agencies have also been added to MVRPC's public participation list.

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Figure 9.5
Significant Projects

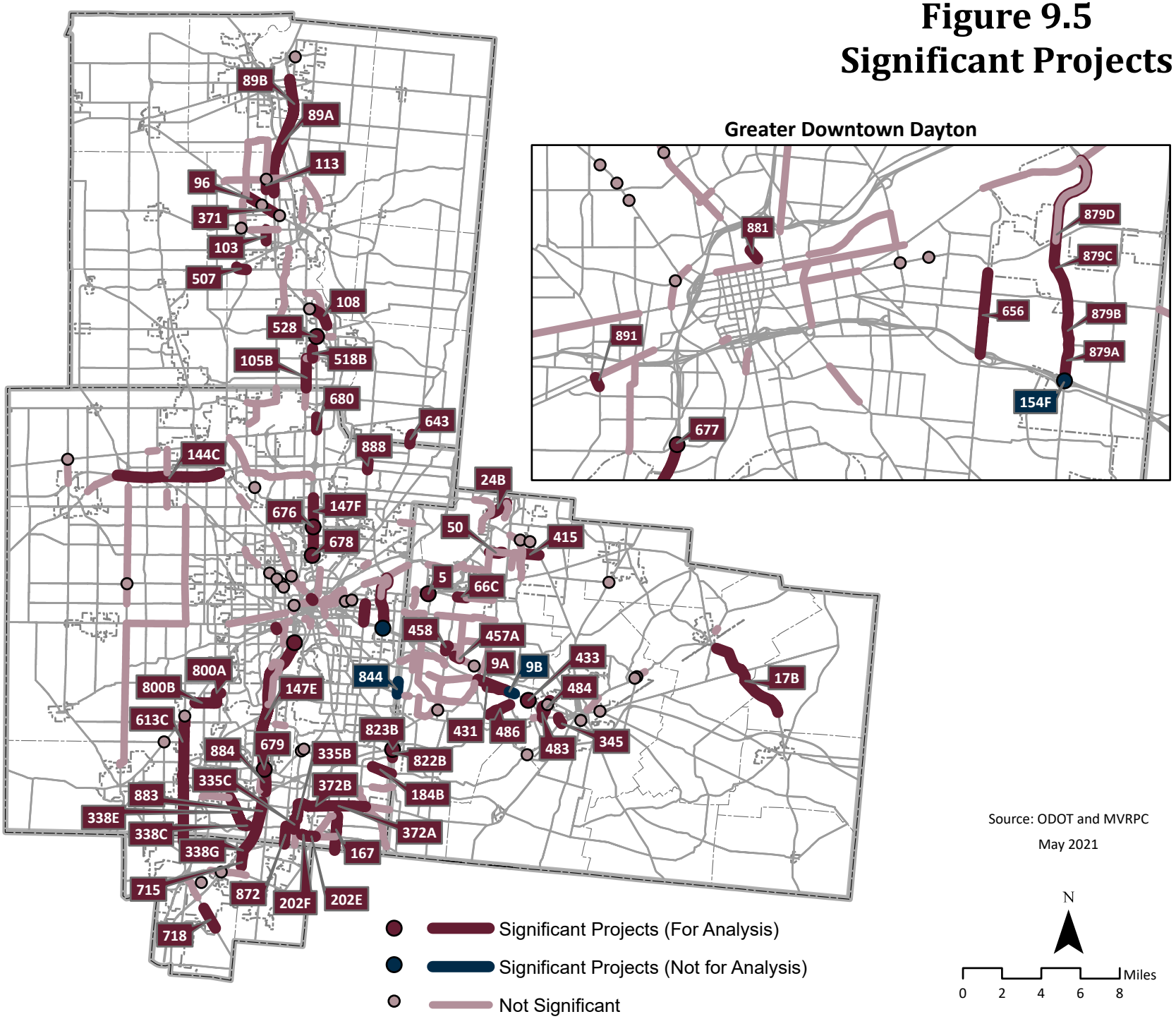


Table 9.3 — Environmental Resources for Mitigation

Resource	Statute	Regional Resources
Wetlands, Rivers, and Streams	**Wetlands**: U.S. ACE mitigation guidelines are outlined in the Regulatory Guidance Letter 02-02, dated December 24, 2002. The Ohio Environmental Protection Agency has specific guidelines for wetland mitigation included in the Ohio Administrative Code 3745-1-50-54. **Rivers & Streams**: No formal rules in Ohio, but mitigation is required for unavoidable impacts. Case-by-case requirements negotiated with OEPA and U.S. ACE by the ODOT Office of Environmental Services.	The Region has approximately 35 square miles of wetlands. The Region contains all or part of many rivers and streams, including designated scenic rivers: the Little Miami River, the Stillwater River, and the Greenville Creek. There are also several major lakes. Much of the Region is contained in the Great Miami River Watershed. These healthy waterways provide many opportunities for water-based recreation, and habitats for fish.
Threatened and Endangered Species/Fish and Wildlife	The Region is bound by regulations to build and operate its roadway projects with no, or minimal, impacts to protected species and their habitats. Statutes providing and defining these regulations include: the National Environmental Policy Act, the Endangered Species Act, the Clean Water Act, and the Ohio Revised Code.	Land-use changes have been the most common cause for decline in species range and diversity. Contamination and degradation of natural waters has also contributed to loss of habitat. The Miami Valley has wetlands, river corridors, moist and dry woods, farmland, and prairies that serve as habitat for numerous plants and animal species. The Region is part of the largest hardwood forest in the world, and an important flyway for migrating birds.
Historic, Cultural, or Archaeological Resources	Historic and cultural resource reviews for all federal and state funded projects in the Region are planned and designed to comply with the National Environmental Policy Act, the National Historic Preservation Act, Section 4(f) of the Department of Transportation Act, the Ohio Revised Code, and 36 CFR Part 800 (the implementing regulations for Section 106 of the National Historic Preservation Act). All acts require that historic and cultural resources be considered during the development of all transportation projects in Ohio.	The Region has numerous cultural, archaeological, and National Register historic sites. As of 2017, 233 sites in the Region were listed on the National Register of Historic Places (NRHP). Additionally, 4 undisturbed archaeological sites are located throughout the area. These sites are important to our communities and heritage.
Parklands	Section 4(f) of the Department of Transportation Act requires that special effort be made to preserve public park and recreation lands, wildlife and waterfowl refuges, and historical sites. Section 4(f) specifies that federally-funded transportation projects requiring the use of land from a public park, recreation area, wildlife and waterfowl refuge, or land of significant historic site can only occur if there is no feasible and prudent alternative. Using Section 4(f) land requires all possible planning to minimize harm.	The Region has one national park, several state and local parks, and wildlife and waterfowl refuges. The parklands are subdivided into natural protection areas and recreational areas. These sites are important to our communities for their promotion of healthy active lifestyles, connection to natural environments and preservation.
Hazardous Materials	The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its Superfund Amendments and Reauthorization Act (SARA) amendment establish national policy and procedures for identifying and cleaning up sites found to be contaminated with hazardous substances. The Acts created the Hazard Ranking System (HRS), which determines the likely level of threat to human health and the environment upon initial investigation. High-ranking projects are eligible to be placed on the National Priority List, which enables application for environmental clean-up funds. CERCLA is important to the highway planning process primarily in the acquisition of right-of-way. Accepting financial liability for contaminated property may adversely affect the financial feasibility of a project. Additionally, significant need for clean-up may cause project delays.	Twelve sites in the Region are on the NPL. Another 53 sites, though not currently on the NPL, are potentially contaminated sites and sources of concern. Table 9.4 provides a summary of the NPL sites, HRS scores, and stage of cleanup. Additionally, a brief summary of each site is provided.

Coordination and Consultation	Mitigation
The ODOT Office of Environmental Services in cooperation with ODOT Districts, the ODOT-Office of Real Estate, the ODOT-Office of Aerial Engineering, and project consultants coordinate to develop all stream and wetland mitigation projects.	Mitigation needs are determined, and an analysis is performed to develop mitigation opportunities. A plan of action is developed in coordination with resource and regulatory agencies, along with a report. The report is submitted with permit applications, with revisions before permit approval. Conservation easements are procured. Funding is received and credits obtained. Construction plans are developed and carried out with monitoring and post-construction monitoring by ODOT.
The Fish and Wildlife Coordination Act (16 U.S.C. 661-666) requires coordination among (1) the agency proposing the highway project, (2) the U.S. Fish and Wildlife Service of the Department of the Interior, and (3) the state agency responsible for protecting wildlife resources whenever the waters of any stream or other water body are proposed to be impounded, diverted, or otherwise modified.	A Habitat Conservation Plan, as required by the Endangered Species Act, may include: • Preserving habitat through an acquisition or a conservation easement; • Enhancing or restoring degraded or former habitat; • Creating new habitat; • Establishing buffer areas around existing habitat; • Modifying land-use practices; and • Restricting access to habitat.
Consultation with various entities, including the Federal Highway Administration (FHWA), the State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation (ACHP), city historic preservation offices, local public officials, local organizations, and the public, is required during the project development process.	A mitigation plan is developed with stakeholders (e.g. ODOT, SHPO, FHWA, local officials, organizations, and the public) through the Section 106 Memorandum of Agreement (MOA) consultation process. Measures vary depending on the projected impact and may include aesthetic treatments, avoidance, archaeological data recovery, salvage/re-use of historic materials, and other methods. Measures must be completed and accounted for with SHPO and FHWA.
Project sponsors, ODOT, and officials with jurisdiction over Section 4(f) resources closely coordinate throughout the project development process to minimize harm or mitigate impacts on protected resources. Long-range planning should account for well-known Section 4(f) resources throughout the Region that would pose a significant loss if affected. It is, however, premature to analyze individual projects' Section 4(f) impacts this early in the process.	The cost of mitigation should be a reasonable public expenditure in light of the severity of the impact on the Section 4(f) resource in accordance with federal requirements. Mitigation for common Section 4(f) resource impacts may be: • Improving access or expansion/pavement of parking area; • Landscape or screening of resource; • Installation of beautification enhancements such as park benches, trash receptacles, signage, etc.; • Maintenance of traffic accommodation or rerouting of traffic; • Minimizing construction noise or limiting construction to specific times; • Direct compensation for improvements to on-site resources; and • Design refinements.
The U.S. EPA provides guidelines and Hazard Ranking System scores. There is an eight stage process: 1) New listing 2) Remedial assessment not begun 3) Remedial assessment not begun with removal 4) Study Underway 5) Remedy Selected 6) Designing Underway 7) Construction Underway 8) Construction Complete Note that, in many cases, "construction complete" does not mean cleanup is complete. There may be ongoing actions required once the infrastructure is in place.	If any initial studies or preliminary environmental evaluations identify known or potential hazardous waste sources, alternatives to avoid the site must be explored. If the site cannot be avoided, an assessment including sampling and possibly a characterization of the problem should be conducted. When a hazardous waste site is identified, the type of regulatory actions it is subject to and any environmental databases or lists that it appears on along with regulatory identification numbers should be specified. In addition: • Environmental site assessment screenings (and any other required assessments) will be conducted on a project-by-project basis; and • Unavoidable encroachment on an identified hazardous site will be mitigated according to all applicable federal, state, and local requirements.

Table 9.4 — Environmental Mitigation Analysis - Endangered Species Matrices

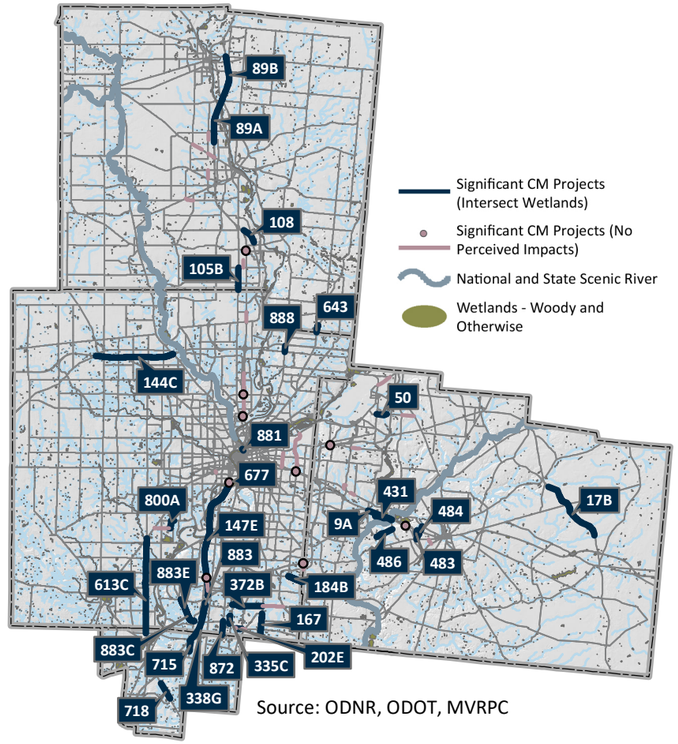
Ohio Status	Category	Common Name	Species	Greene	Miami	Montgomery	Warren
Endangered	Plant	Blue corporal	Ladona deplanata				x
	Plant	Ear-leaved-foxglove	Agalinis auriculata	x			
	Plant	False Melic	Schizachne purpurascens	x			
	Plant	Plains Muhlenbergia	Muhlenbergia cuspidata			x	
	Plant	Running Buffalo Clover	Trifolium stoloniferum				x
	Plant	Sharp's Green-cushioned Moss	Weissia sharpii	x			
Threatened	Plant	Ashy Sunflower	Helianthus mollis		x		
	Plant	Canada Milk-vetch	Astragalus canadensis				x
	Plant	Carolina Whitlow-grass	Draba reptans	x		x	
	Plant	Downy White Beard-tongue	Penstemon pallidus			x	
	Plant	Dwarf Bulrush	Lipocarpha micrantha			x	
	Plant	Flat-leaved Bladderwort	Utricularia intermedia		x		
	Plant	Hairy Mountain-mint	Pycnanthemum verticillatum var. pilosum			x	
	Plant	Harebell	Campanula rotundifolia		x		
	Plant	Inland Rush	Juncus interior				x
	Plant	Least Bittern	Ixobrychus exilis	x			
	Plant	Midland Sedge	Carex mesochorea	x			
	Plant	Midwest Spike-moss	Selaginella eclipes	x			
	Plant	Red Baneberry	Actaea rubra	x			
	Plant	Rock Serviceberry	Amelanchier sanguinea	x	x		
	Plant	Royal Catchfly	Silene regia	x			
	Plant	Seaside Arrow-grass	Triglochin maritimum	x	x		
	Plant	Soft-leaved Arrow-wood	Viburnum molle			x	
	Plant	Sprengel's Sedge	Carex sprengelii		x		
	Plant	Tansy Mustard	Descurainia pinnata			x	
	Plant	Timid Sedge	Carex timida		x	x	
	Plant	Wall-rue	Asplenium ruta-muraria	x			
	Plant	Wood's-hellebore	Melanthium woodii		x	x	

Ohio Status	Category	Common Name	Species	Greene	Miami	Montgomery	Warren
Endangered	Amphibian - Salamander	Eastern Hellbender	Cryptobranchus alleganiensis alleganiensis	x	x	x	
	Bird	Northern Harrier	Circus cyaneus	x		x	
	Fish	Iowa Darter	Eltheostoma exile	x	x		
	Fish	Northern Madtom	Noturus stigmosus				x
	Insect - odonate	Plains Clubtail	Gomphus externus	x		x	
	Invert. - fw bivalve	Rayed Bean	Villosa fabalis	x	x	x	x
	Invert. - fw bivalve	Fanshell	Cyprogenia stegaria	x	x		
	Invert. - fw bivalve	Sharp-ridged Pocketbook	Lampsillis ovata			x	
	Invert. - fw bivalve	Washboard	Megalonaias nervosa				x
	Invert. - fw bivalve	Purple Lilliput	Toxolasma lividus				x
	Invert. - fw bivalve	Snuffbox	Epioblasma triquetra	x	x	x	x
	Invert. - fw bivalve	Clubshell	Pleurobema clava	x	x	x	x
	Mammal	Indiana Myotis	Myotis sodalis	x	x	x	x
	Reptile - Snake	Eastern Massasauga	Sistrurus catenatus catenatus	x		x	x
Threatened	Bird	Black-crowned Night-Heron	Nycticorax nycticorax			x	
	Fish	Tonguetied Minnow	Exoglossum laurae	x			
	Fish	American Eel	Anguilla rostrata				x
	Fish	Mountain Madtom	Noturus eleutherus				x
	Invert. - fw bivalve	Black Sandshell	Ligumia recta	x			x
	Invert. - fw bivalve	Pondhorn	Uniomerus tetralasmus			x	
	Invert. - fw bivalve	Threehorn Wartyback	Obliquaria reflexa				x
	Invert. - fw bivalve	Fawnsfoot	Truncilla donaciformis				x
	Invert. - decapod	Sloan's Crayfish	Orconectes (Rhoadesius) sloanii			x	x
	Mammal	Eastern Harvest Mouse	Reithrodontomys humulis				x

Source: Ohio Department of Natural Resources – Division of Wildlife

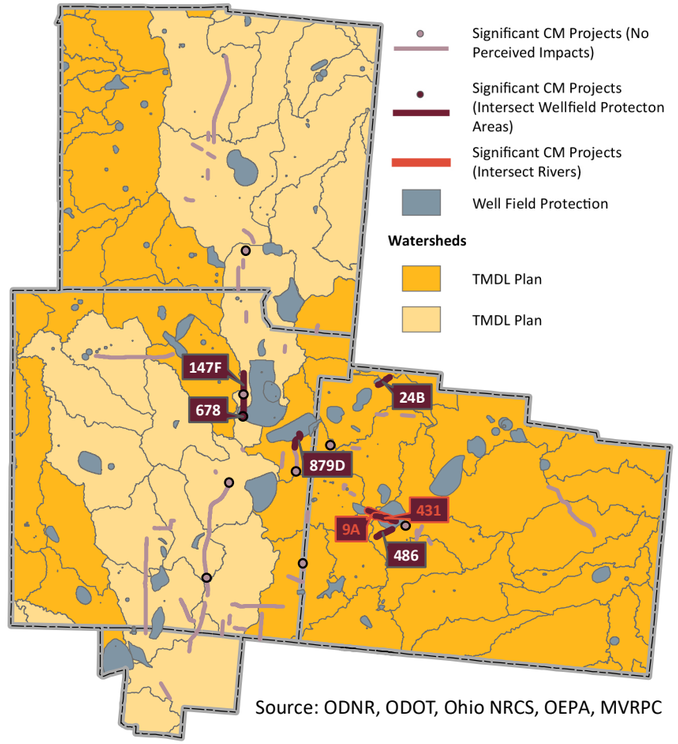
MVRPC

Wetlands and Scenic Rivers



Source: ODNR, ODOT, MVRPC

Watersheds and Wellfields

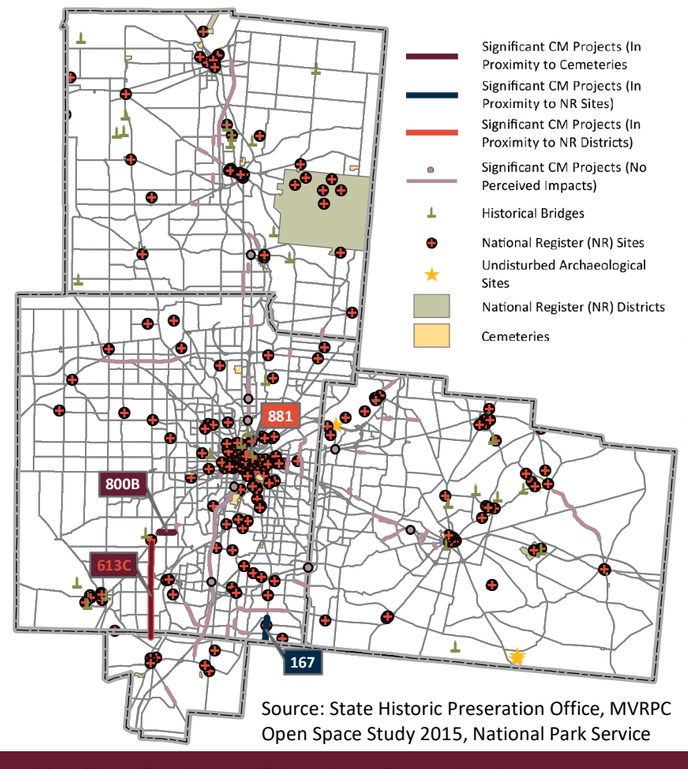


Source: ODNR, ODOT, Ohio NRCS, OEPA, MVRPC

Endangered Species

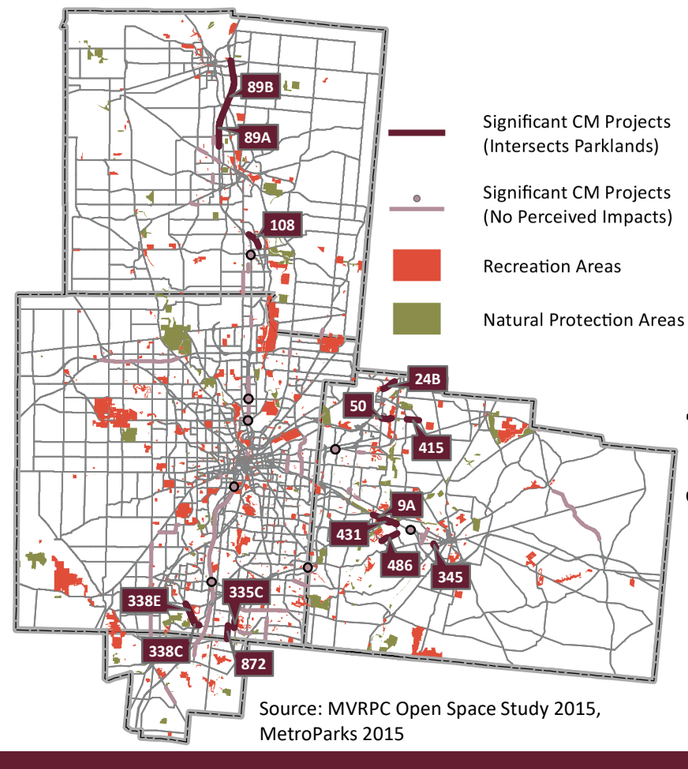
See Table 9.4 for Endangered Species Matrices

Cultural Features



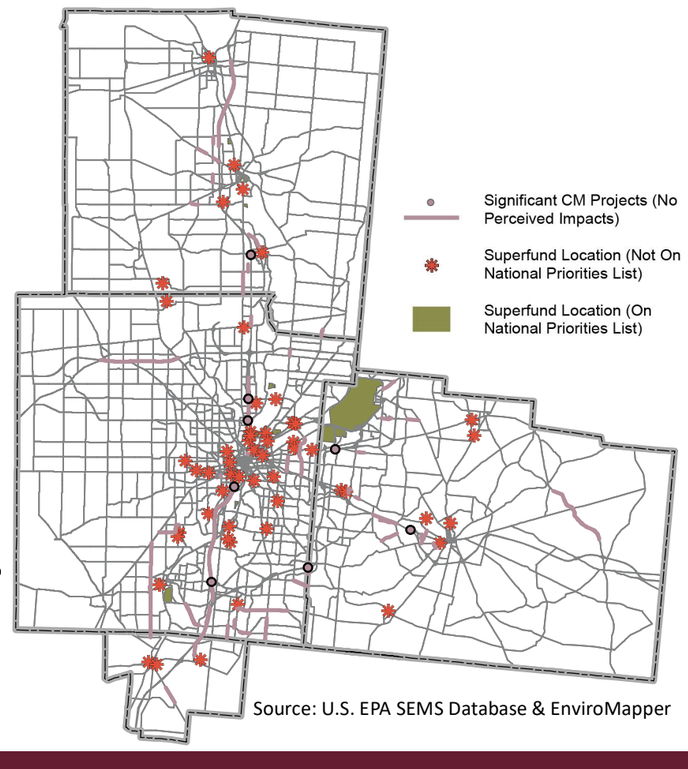
Source: State Historic Preseration Office, MVRPC Open Space Study 2015, National Park Service

Parklands



Source: MVRPC Open Space Study 2015, MetroParks 2015

Superfund Locations



Source: U.S. EPA SEMS Database & EnviroMapper

Figure 9.6 Environmental Mitigation Analysis

N

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Table 9.5 — Superfund Sites on Final NPL

Site Name and Location	HRS Score	Stage of Clean-up	Description
Lammers Barrel Factory, Greene County	69.33	Remedial Action Underway	According to former employees, Lammers Barrel Factory sold and reclaimed all types of solvents. Any inventories of chemicals handled at the facility were reportedly destroyed in a fire. Sampling analysis identified an area of ground water contamination along the northern end of the Valleywood subdivision, located southeast of the facility.
United Scrap Lead Co. Inc., Miami County	58.15	Construction Completed	The United Scrap Lead Co., Inc. reclaimed lead batteries, generating an estimated 32,000 cubic yards of crushed battery cases, which were used as fill material. Monitoring wells on-site are contaminated with lead, according to tests conducted by the State. Two residential water wells contain lead above background levels but within the standards for drinking water.
Wright-Patterson Air Force Base, Montgomery/Greene Counties	57.85	Construction Completed	Past Air Force activities in support of operational missions have resulted in the creation of several unlined waste disposal areas throughout the base. More than 791 tons of waste have been disposed on the Base, including solvents, contaminated thinners, degreasing sludges, tetraethyllead sludge, and miscellaneous hazardous chemicals. In 1985, the Base and OEPA found 1,1,1-trichloroethane, tetrachloroethylene, trichloroethylene, 1,2-dichloroethane, and manganese in on-base wells.
Miami County Incinerator, Miami County	57.84	Construction Completed	A combination of poor geologic location and environmentally unsound disposal practices resulted in significant contamination to one of the most productive and valuable aquifers in Ohio. All landfilling operations stopped in l978, and the site now serves as a transfer station for wastes that are disposed of elsewhere.
North Sanitary Landfill, Montgomery County	50	Remedial Action Underway	Several industrial facilities are located adjacent to the property. Industrial and municipal wastes from the Dayton area were used to fill unlined gravel pits that were created by former mining operations. These pits contained water that may have entered the sand and gravel aquifer that the pits intersect.
Behr Dayton Thermal System, Montgomery County	50	Remedy Selected	The site hosts a manufacturer of parts and sub-assemblies of HVAC equipment for auto manufacturers. Industrial solvent cleaners were used in the site manufacturing processes. The solvent cleaners included TCE, tetrachloroethene, 1,1,1-trichloroethane and sulphuric acid. Such compounds have been reported in shallow ground water beneath the Behr facility. Ground water has been contaminated above USEPA's Safe Drinking Water Act's maximum contaminant level (MCL) for TCE. Also, TCE vapors have migrated into residential homes and commercial businesses above a safe indoor air level.
East Troy Contaminated Aquifer, Miami County	50	Remedy Selected	Two ground water plumes on the site are contaminated at various levels with VOCs, including cis-1, 2-dichloroethene (cis-1, 2-DCE), tetrachloroethene (PCE), and trichloroethene (TCE). The State of Ohio currently has an agreement in place to address a source area for one of the plumes. There is no source control on the second plume. The State and USEPA are working to find a comprehensive solution to address both plumes, any additional source areas, and potential issues related to vapor intrusion.

Site Name and Location	HRS Score	Stage of Clean-up	Description
Sanitary Landfill Co., Montgomery County	35.57	Construction Completed	The landfill reportedly accepted municipal wastes and various types of industrial wastes, including solvents. The landfill is located above gravel deposits. Wells supplying drinking water are drilled into an aquifer which may be connected to the gravel deposits, according to a U.S. Geological Survey study. Thus, there is a potential for contamination of public water wells.
Mound Plant (USDOE), Montgomery County	34.61	Construction Completed	The Mound operates to support U.S. weapons and energy programs. The major waste areas include a landfill in which solvents, paints, and photoprocessing and plating bath solutions were deposited; several leach beds used to dispose of solutions containing radionuclides and/or explosive/pyrotechnic materials; and an area in which a solution contaminated with plutonium was spilled.
Powell Road Landfill, Montgomery County	31.62	Construction Completed	Wastes were dumped on the site, including strontium chromate and benzidine. The wastes are toxic, persistent, flammable, and highly volatile. There is no evidence of the landfill being lined, and some containers are leaking. Ground water nearby supplies private wells and the surface water is used for recreational purposes.
West Troy Contaminated Aquifer, Miami County	50	Remedy Selected	VOCs have been detected in two of the five wells in the field, from a yet-unidentified source. Contaminants found in untreated well water include tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE) and 1,1,1-trichloroethane (TCA). PCE amounts were found to exceed the federal maximum contaminant level. A groundwater plume has been identified heading toward the field. Further investigation is needed to identify the source of VOC contamination and define the precise extent of the ground water plume.
Valley Pike VOCs, Montgomery County	50	Study Underway	A mixed industrial and residential site, VOCs were found in groundwater, including tetrachloroethylene (PCE) and trichloroethylene (TCE). Residents have been impacted by vapor intrusion caused by the contaminated groundwater plume. Approximately 400,000 residents are impacted from the drinking water coming from the well fields. However, the site's residents' drinking water is not impacted by the site's conditions. The site remains as an active business.

Source: U.S. EPA SEMS Database https://cumulis.epa.gov/supercpad/cursites/srchsites.cfm

Stormwater Mitigation

The FAST Act of 2015 added a factor for MPOs to consider strategies to reduce or mitigate stormwater impacts of surface transportation. Storm water discharges are generated by runoff from land and impervious areas such as paved streets, parking lots, and building rooftops during rainfall and snow events. Storm water often contains pollutants in quantities that could adversely affect water quality. In Ohio, OEPA implements the federal stormwater program to ensure compliance with the Clean Water Act and National Pollutant Discharge Elimination System (NPDES) requirements.

Construction sites, including transportation improvements, impact Ohio's waters by adding pollutants, especially sediment, to rainwater running off of construction sites during construction as well as making long-term land use changes that alter the hydrology and pollutant loading of local streams. If a project disturbs one or more acres of ground, the project sponsor must get a permit to discharge stormwater from

the site and control stormwater discharges through the use of Best Management Practices (BMPs). Typically, projects are screened during the environmental process and if they exceed the acreage limit, BMPs are included in the construction plans. ODOT's Location and Design Manual has information on acceptable BPM methods.

There are two storm water permit application options construction activities in Ohio. The first is to submit an individual NPDES permit application and the second is to file a Notice of Intent (NOI) form requesting coverage under a general permit. The general permit process is usually easier and faster than the individual permit process. MVRPC requires that all project sponsors comply with applicable federal and state requirements as a condition of receiving funding.

Regional Mitigation and Consultation Resources

The main purpose of various conservation organizations in the Region is to monitor and protect regional land including natural resources and historical properties. Close partnerships with individuals, businesses, and local jurisdictions are a key component for these organizations to achieve their conservation goals. A brief description of each organization in the Region is provided in Table 9.6.

Table 9.6 — Environmental Conservation Organizations in the Region

Responsible Organization	Type of Conservation Organization	Description
Three Valley Conservation Trust	*Land Trust*	The Three Valley Conservation Trust actively seeks to protect agricultural land, forested lands, wildlife areas, wetlands and other scenic or natural lands. The Trust protects streams in Butler, Preble, Montgomery and Darke Counties in Ohio, and very small parts of Wayne, Franklin, and Union Counties in SE Indiana.
Miami Conservancy District	*Flood Protection*	The Miami Conservancy District established its Groundwater Preservation Program in 1997 to develop and maintain an ongoing watershed-wide technical program to help protect and manage the area's aquifer and groundwater resources. Over the years, the organization has branched out to meet the Region's water needs. MCD has been actively involved for many years in promoting recreation along the Region's rivers and streams as well as being a key partner in projects like downtown Dayton's RiverScape, by bringing together state and federal funds to leverage local dollars.
Tecumseh Land Trust	*Land Trust*	The Trust's purpose is to preserve agricultural land, open space, and historic structures in voluntary cooperation with landowners and their heirs, and to educate the public about methods of private land conservation. The Trust currently has about 18,000 acres of farmland in Clark and Greene counties under protective conservation easements.
Ohio Chapter of the US Department of Agriculture	*Government Agency*	Natural Resources Conservation Service (NRCS) assists owners of Ohio's private land with conserving their soil, water, and other natural resources. NRCS partners with the Miami Valley Conservancy District to conserve local soil and water. Several environmental conservation and mitigation programs are offered by NRCS in partnership with local agencies. These include EQIP – Environmental Quality Incentives Program, SWCA – Soil and Water Conservation Assistance, WHIP – Wildlife Habitat Incentives Program, and the WRP – Wetlands Reserve Program.
B-W Greenway Community (B-WGC) Land Trust	*Land Trust*	B-WGC's purpose is to educate the public about the value of wetlands and the importance of connecting the Beavercreek and Wenrick Wetlands with a greenway; to promote sustainable use of land within B-WGC while balancing human and wildlife needs; and to protect, preserve, and steward open space for farming, recreation, habitat, and watershed management.

Responsible Organization	Type of Conservation Organization	Description
Beavercreek Wetlands Association	*Land Trust*	BCWA helps protect the wetland ecosystems in the Beaver Creek watershed in Greene County through partnerships, community networks, and public education.
Ohio Chapter of the Worldwide Conservation Organization	*Nature Conservancy*	The Nature Conservancy works to protect large landscapes made up of plants, animals, and natural communities all over Ohio including the Miami Valley Region.
Little Miami, Inc.	*Watershed / Land Trust*	Little Miami, Inc. (LMI) was founded in 1967 as a 501(c)(3) nonprfit organization dedicated to the restoration and protection of the Little Miami Wild & Scenic River. The organization owns over 110 nature preserves along the Little Miami and several tributaries, preserving over 12% of the Little Miami's riverfront forests. An additional 44% of the riverfront lands are protected through public and quasi-public ownership.
Honeycreek Watershed Association	*Watershed*	The Association seeks to protect and enhance the ground and surface water resources of the Honey Creek Watershed through education and project implementation. The Association helps preserve the Watershed by protecting riparian lands, monitoring water quality to identify potential sources of pollution, and educating residents about everything from proper septic system maintenance to landscaping with native vegetation.
Dayton History	*Historical Preservation*	This regional organization collects, preserves, interprets, presents and promotes the Region's assets, stories and experiences. The organization also maintains "Preservation Watch List" for the Region's historical assets.
Preservation Dayton, Inc.	*Historical Preservation*	Preservation Dayton actively promotes the work of preservation, protection and enhancement, and historically sympathetic revitalization of the Dayton, Ohio community through advocacy and a variety of other creative methods.
Greene County Parks and Trails	*Parks and Recreation*	The County is the home of nearly 3,000 acres of green space held in public interest in 27 parks and recreation sites (though it owns 33 . It manages 62 miles of paved, multiuse trails conecting to over 340 miles of regional trails as well as 36 miles of river trails and more than 24 miles of hiking trails.
Five Rivers MetroParks	*Parks and Recreation*	The Five Rivers MetroParks (FRMP) district is a nationally recognized park system composed of natural area parks, gardens, sensitive river corridors, urban parks, and a network of recreational trails. Its key mission is to protect rapidly disappearing open space and natural areas in the Miami Valley.
Miami County Park District	*Parks*	The County offers beautiful farmland, the Great Miami River, and charming parks. The Miami County Park District has 15 parks and recreation sites. The mission of the District is to acquire and manage outstanding natural resources for the purpose of preservation, conservation, education, and passive leisure activities for the people of Miami County. The District continues to strive to excel in the areas of environmental education, bikeway development, and land acquisition.
Greene Soil & Water Conservation District	*Water Conservation*	The Greene Soil and Water Conservation District provides urban and rural water quality and erosion control technical assistance, conservation education for all ages, land use planning, forestry and wildlife management, drainage information and design, and maps, including soil, flood plains, and aerial.
National Aviation Heritage Alliance	*Historical Preservation*	The National Aviation Heritage Alliance is an organization that seeks to conserve, interpret, develop, and promote the historic resources of the National Aviation Heritage Area. Its vision is to make the Dayton region the recognized global center of aviation heritage and premier destination for aviation heritage tourism, sustaining the legacy of the Wright brothers. The Alliance comprises of an eight-county area in SW Ohio (Montgomery, Greene, Miami, Clark, Warren, Champaign, Shelby, and Auglaize counties).

Source: MVRPC

CHAPTER 10

COMMUNITY IMPACT ASSESSMENT

10.1 Overview

MVRPC conducts a Community Impact Assessment to address Environmental Justice (EJ) & Equity issues in the 2050 LRTP, and ensure that vulnerable population groups do not bear an unreasonable or inequitable share of the costs associated with planning processes and initiatives. As such, MVRPC undertakes extensive measures to identify locations where such vulnerable populations are concentrated in the Region, and to extend additional public outreach efforts to those communities.

Technical analyses — travel time to work; travel time to basic services such as grocery stores, medical centers, and community centers; and transit and regional bikeway accessibility — were performed, and the findings indicated that vulnerable population groups were largely unaffected by the 2050 LRTP in comparison to the general population.

The following sections of this chapter articulate those efforts and document the results of MVRPC's efforts towards addressing Environmental Justice (EJ) & Equity issues in the 2050 LRTP.

10.2 Background[14]

MVRPC, as a MPO, receives federal funding to support many of its programs and activities, and must address the federal EJ requirements as a condition of receiving those funds.

Principles of Environmental Justice

The U.S. Department of Transportation (U.S. DOT) describes the three basic principles of EJ as:

- Ensuring public involvement of low-income and minority groups in decision making;
- Preventing "disproportionately high and adverse" impacts of decisions on low-income and minority groups; and
- Assuring low-income and minority groups receive proportionate share of benefits.

In general, this means that for any program or activity for which any federal funds will be used, the agency receiving the federal funds must make a meaningful effort to involve low-income and minority populations in the decision-making processes established for the use of federal funds, and evaluate the nature, extent, and incidence of probable favorable and adverse human health or environmental impacts of the program or activity upon minority or low-income populations.

[14] Ohio Department of Transportation (ODOT), Guidance and Best Practices for Incorporating Environmental Justice into Ohio Transportation Planning and Environmental Processes, August, 2002.

Regulatory Framework

Under Title VI of the 1964 Civil Rights Act and related statutes, each federal agency is required to ensure that no person is excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, disability, or religion. Title VI bars intentional discrimination as well as disparate impact discrimination (i.e., a neutral policy or practice that has a disparate impact on low income and minority groups).

The National Environmental Policy Act of 1969 (NEPA) stressed the importance of providing for, "all Americans a safe, healthful, productive, and aesthetically pleasing surroundings," and provided a requirement for taking a "systematic, interdisciplinary approach" to aid in considering environmental and community factors in decision-making.

This approach was further emphasized in the Federal-aid Highway Act of 1970: 23 United States Code 109(h). It established a further basis for equitable treatment of communities affected by transportation projects. It requires consideration of the anticipated effects of proposed transportation projects upon residences, businesses, farms, accessibility of public facilities, tax base, and other community resources.

On February 11, 1994, President Clinton, recognizing that the impacts of federal programs and activities may raise questions of fairness to affected groups, signed Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The Executive Order requires that each federal agency shall, to the greatest extent allowed by law, administer and implement its programs, policies, and activities that affect human health or the environment so as to identify and avoid "disproportionately high and adverse" effects on minority and low-income populations.

On June 29, 1995, the U.S. Department of Transportation (U.S. DOT) published its draft Order to Address Environmental Justice in Minority Populations and Low-Income Populations in the Federal Register. The report was primarily a reaffirmation of the principles of 1964's Title VI.

On April 15, 1997, U.S. DOT published the final Order to Address Environmental Justice in Minority Populations and Low-Income Populations (U.S. DOT Order 5610.2). The order complies with the President's 1994 Executive Order 12898.

On October 1, 1999, a U.S. DOT letter interpreting EJ further clarified that transportation agencies are to ensure that low-income populations and minority populations receive a proportionate share of benefit from federally funded transportation investments.

On August 11, 2000, Executive Order 13166: Improving Access to Services for Persons with Limited English Proficiency, was signed by President Clinton. This executive order stated that individuals who do not speak English well and who have a limited ability to read, write, speak, or understand English are entitle to language assistance under 1964's Title VI with respect to a particular type of service, benefit, or encounter.

In June 2012, the Federal Highway Administration (FHWA) issued FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 6640.23A) that require the FHWA

to implement the principles of the DOT Order 5610.2(a) and the Executive Order 12898 by incorporating environmental justice principles in all FHWA programs, policies, and activities.

10.3 MVRPC's Approach to Environmental Justice

Recognizing the importance of incorporating EJ issues into the transportation planning process, MVRPC initiated both quantitative and qualitative approaches to address EJ requirements for the 2050 LRTP.

MVRPC adopted four main approaches during the process of updating its 2050 LRTP to address EJ issues, following the guidelines in Guidance and Best Practices for Incorporating Environmental Justice into Ohio Transportation Planning and Environmental Processes, published by ODOT, and recommendations of the Ohio EJ Task Force. This guidance document presents methods and approaches for ensuring that the interests of minority and low-income populations are considered and the impacts on these populations are identified and addressed within the current transportation decision-making processes. Further, it presents concepts for developing public participation programs that reach target populations. MVRPC's approach included:

- Defining target populations;
- Identifying target areas;
- Conducting tests for adverse impacts; and
- Taking extra public participation efforts to fully engage diverse population groups.

10.4 Defining Vulnerable Populations

MVRPC's analysis groups included the EJ populations of racial and ethnic minorities and persons in poverty. Further, MVRPC expanded the target populations to include other traditionally vulnerable groups, such as persons with disabilities, the elderly, and households without automobiles.

Data Sources

A variety of data sources exist pertaining to population demographics. Not all sources, however, are of equal quality. MVRPC, therefore, used the 2010 Census and the 2008-2012 American Community Survey (ACS) data as primary data sources for analysis of target population groups. For minority, elderly, and Hispanic variables, 2010 Census Summary File 1 (SF1) block level data were aggregated to the traffic analysis zone (TAZ) level using GIS. For the remaining variables (poverty, disability, and zero-car households), 2008-2012 ACS 5-Year Estimate block group data was converted to the TAZ level, using spatial analysis techniques.

Definition of Population Groups

MVRPC defined the target populations as follows:

Minority Population

All persons of races other than Caucasian were considered minorities, including African-American; American Indian or Alaska Native; Asian; Native Hawaiian or Other Pacific Islander; some other race alone; and persons of two or more races. It is important to note that the population of Hispanic origin was not counted as a race since the U.S. Census Bureau treats persons of Hispanic origin as an ethnic group, not a race.

Hispanic Population

Persons who classified themselves in one of the specific Spanish/Hispanic/Latino origin categories listed, such as Mexican, Mexican-American, Puerto Rican, or Cuban, as well as those who indicated that they were of other Spanish/Hispanic/Latino origin. Persons of Hispanic origin may be of any race.

Persons in Poverty

Persons in poverty are defined as the sum of the number of persons in families with income below the poverty threshold and the number of unrelated individuals with incomes below the poverty thresholds. The set of poverty thresholds varies by family size and composition and age of householder. MVRPC defined the poverty population based on available ACS data tabulated for total household population plus non-institutionalized group quarters.

Disabled Population

In 2010, the ACS began using a new definition of disabled populations, focusing on the impact conditions have on basic functioning rather than the presence of conditions. Consistent with this new definition, MVRPC defined the disabled population based on available ACS data tabulated for household population 18 years of age and over. A person was considered as having a disability if he/she met any of the following conditions. A brief description of each disability category is as follows:

- Hearing difficulty — deaf or having serious difficulty hearing.
- Vision difficulty — blind or having serious difficulty seeing, even when wearing glasses.
- Cognitive difficulty — because of a physical, mental, or emotional problem, having difficulty remembering, concentrating, or making decisions.
- Ambulatory difficulty — having serious difficulty walking or climbing stairs.
- Self-care difficulty — having difficulty bathing or dressing.
- Independent living difficulty — because of a physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor's office or shopping.

Elderly Population

The elderly population is defined as all persons 65 years of age and older.

Zero-Car Households

Zero-Car Households are households with no automobiles at home and available for the use of household members.

Limited English Proficiency Population

In SFY 2013, MVRPC completed a Limited English Proficiency (LEP) analysis for the MPO area.[15] The analysis indicates that less than 1 percent of the population 5 years or older (approximately 5,400 individuals) is not proficient in English. Approximately 50 percent of the LEP individuals speak Spanish as their primary language with the remainder speaking other Indo-Euro, Asian Pacific, or other languages. As a result, MVRPC is focusing its outreach efforts on the Spanish speaking population.

Posters, both English and Spanish versions, advertising the public participation meetings are provided to GDRTA hubs, Greene CATS Public Transit, and Miami County Transit offices. They are also distributed to the Latino Connection, a local Hispanic community-based outreach organization. Newspaper ads are printed in both Spanish and English in La Mega Nota, a free newspaper distributed throughout the Region.

10.5 Identifying Target Areas

MVRPC identified target areas by examining the concentration of the target populations at the TAZ level using Geographic Information Systems (GIS).

Population Thresholds

The target population thresholds were calculated for each population demographic variable under examination in order to locate the areas of high concentration. The TAZ population (e.g., elderly persons) was aggregated to the county level and a county average percentage for each target population was calculated. Using the county average percentage as a threshold, the areas of high concentration were identified. Target population averages were calculated individually for each county, as opposed to an MPO average, to reflect the unique nature of each county. The county thresholds for each target population are listed in Table 10.1.

- Minority Population — Montgomery County has the highest percentage of minorities in the Region. Over 26% of Montgomery County residents are minorities. On the other hand, only 5.6% of the Miami County residents are minorities.

- Hispanic Population — A higher percentage of persons of Hispanic descent live in Montgomery and Warren Counties (2.3% each), followed closely by Greene County (2.1%) and Miami County with the least (1.3%).

- People in Poverty — In the Region, Montgomery County has the highest percentage of people in poverty (16.7%), compared to Greene, Miami, and Warren Counties with 13.5%, 12.2%, and 6.3%, respectively.

- Disabled Population — Montgomery County has the highest percentage of disabled population in the Region (18.4%), followed by Miami, Greene, and Warren Counties, at 15.5%, 14.1%, and 11.4%, respectively.

[15] The full report can be viewed here: http://www.mvrpc.org/sites/default/files/LimitedEnglishProficiencyAnalysis.pdf

- Elderly Population — A higher percentage of elderly population lives in Miami and Montgomery counties (15.4% and 15.1%, respectively), compared to Greene and Warren Counties (13.6% and 10.8%, respectively).

- Zero-Car Households — Montgomery County has the highest percentage of households without access to cars. Almost one in ten households (9.5%) reported having no cars in the 2008-2012 data.

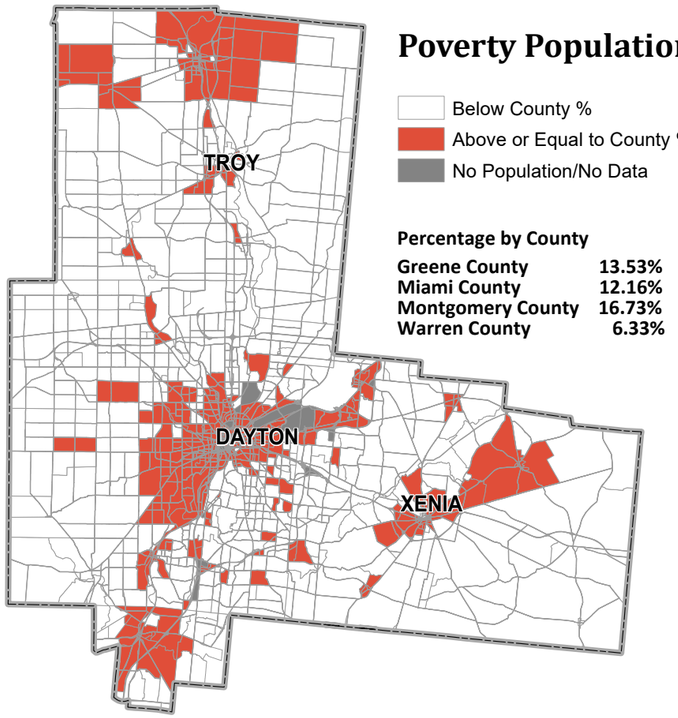
Table 10.1 — Target Population Thresholds

	County	Total	Threshold
People in Poverty	Greene	20,714	13.53%
	Miami	12,366	12.16%
	Montgomery	87,503	16.73%
	Warren	3,929	6.33%
Disabled Population	Greene	16,647	14.13%
	Miami	11,897	15.50%
	Montgomery	73,416	18.44%
	Warren	4,396	11.42%
Zero-Car Households	Greene	3,037	4.83%
	Miami	2,112	5.17%
	Montgomery	21,304	9.51%
	Warren	2,047	2.68%
Minority Population	Greene	21,903	13.56%
	Miami	5,784	5.64%
	Montgomery	139,881	26.14%
	Warren	20,262	9.53%
Hispanic Population	Greene	3,439	2.13%
	Miami	1,341	1.31%
	Montgomery	12,177	2.28%
	Warren	4,784	2.25%
Elderly Population	Greene	21,998	13.61%
	Miami	15,731	15.35%
	Montgomery	81,041	15.14%
	Warren	22,936	10.78%

Sources: 2010 Census and 2008-2012 American Community Survey

MVRPC

Figure 10.1 Environmental Impact Assessment: Target Group Populations

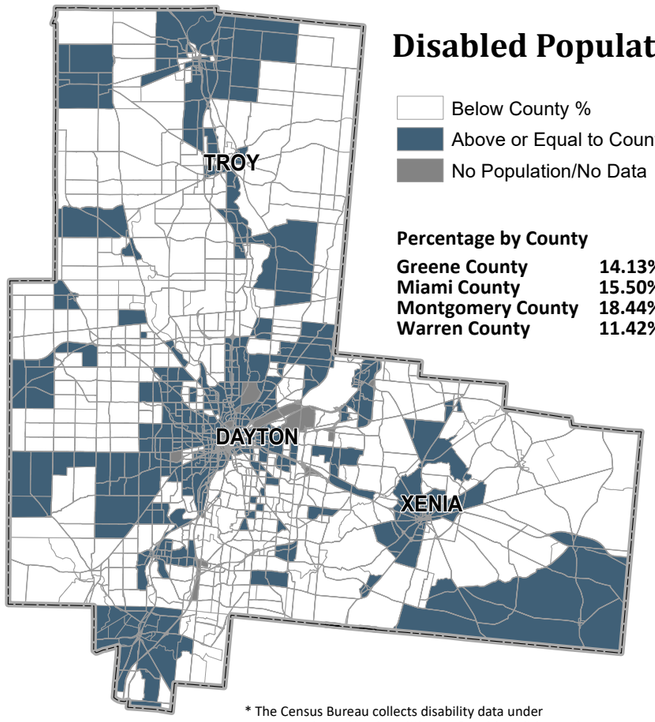


Poverty Population

- Below County %
- Above or Equal to County %
- No Population/No Data

Percentage by County

Greene County	13.53%
Miami County	12.16%
Montgomery County	16.73%
Warren County	6.33%



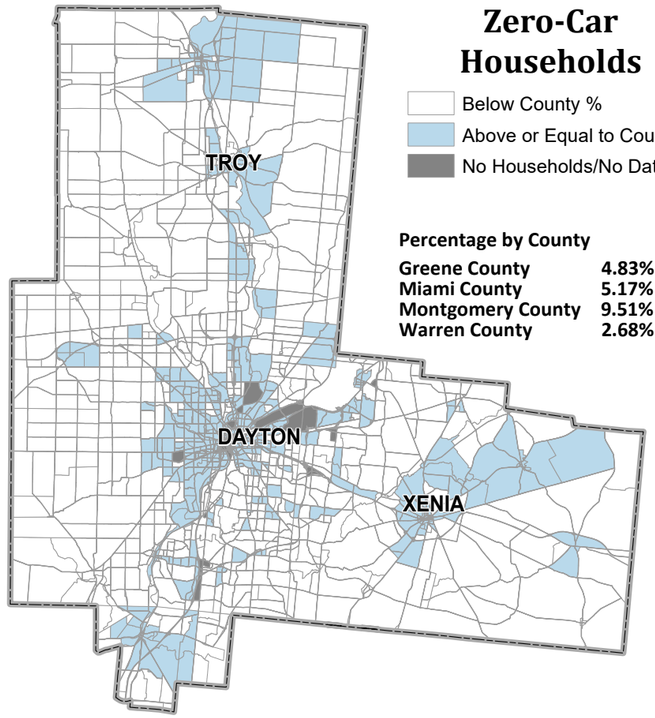
Disabled Population

- Below County %
- Above or Equal to County %
- No Population/No Data

Percentage by County

Greene County	14.13% *
Miami County	15.50% *
Montgomery County	18.44% *
Warren County	11.42% *

* The Census Bureau collects disability data under the categories of Hearing difficulty, Cognitive difficulty, Ambulatory difficulty, Self-Care difficulty, and Independent Living difficulty.

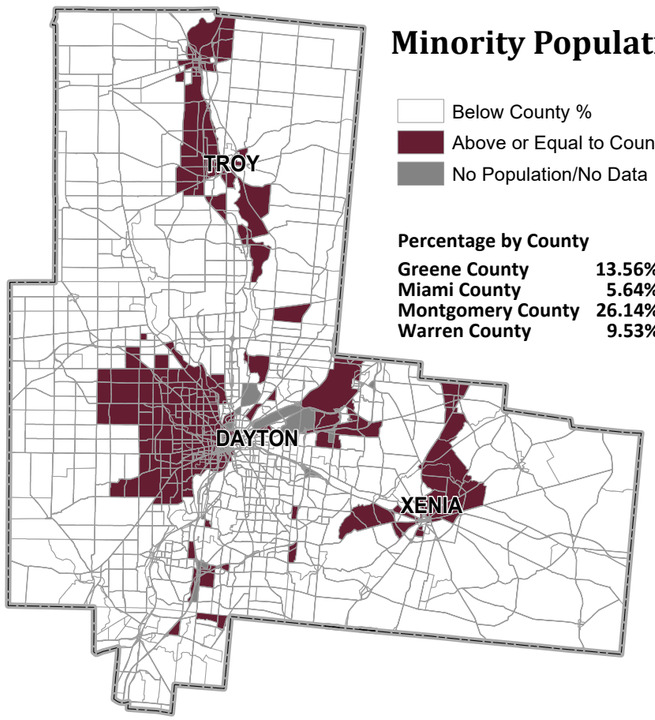


Zero-Car Households

- Below County %
- Above or Equal to County %
- No Households/No Data

Percentage by County

Greene County	4.83%
Miami County	5.17%
Montgomery County	9.51%
Warren County	2.68%

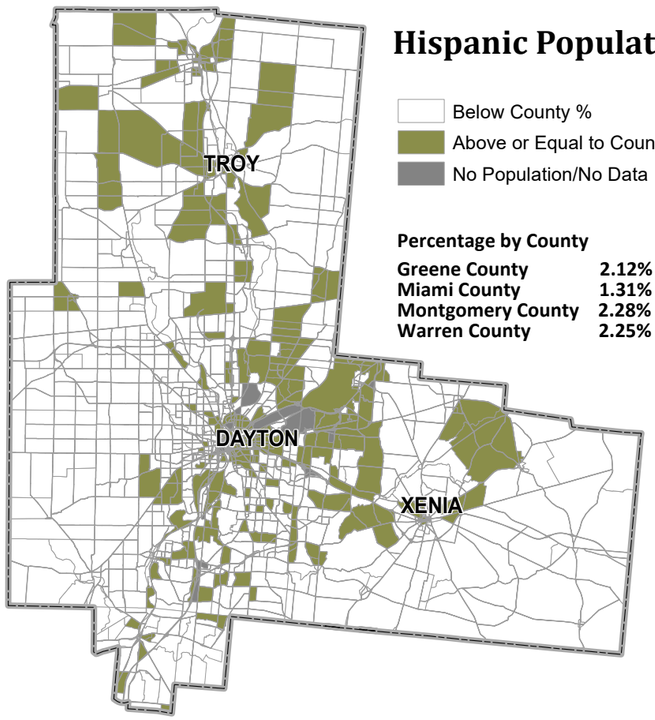


Minority Population

- Below County %
- Above or Equal to County %
- No Population/No Data

Percentage by County

Greene County	13.56%
Miami County	5.64%
Montgomery County	26.14%
Warren County	9.53%

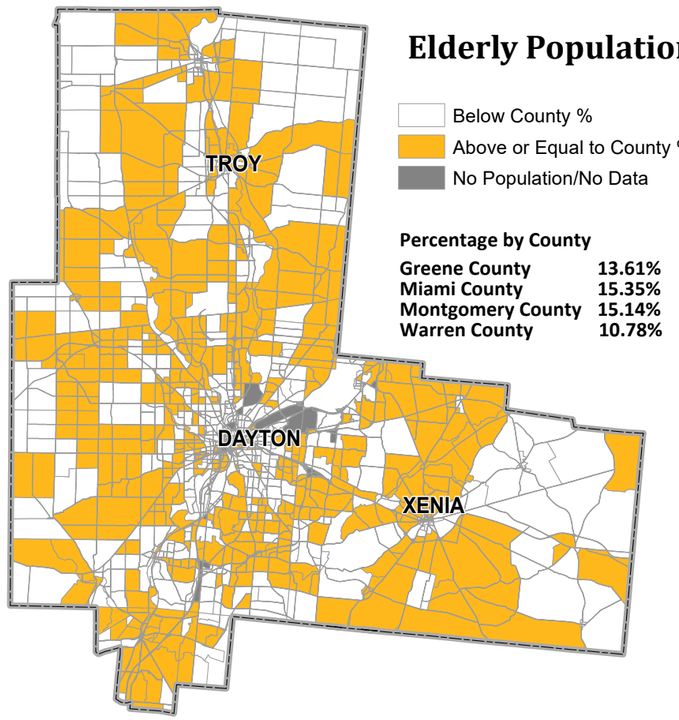


Hispanic Population

- Below County %
- Above or Equal to County %
- No Population/No Data

Percentage by County

Greene County	2.12%
Miami County	1.31%
Montgomery County	2.28%
Warren County	2.25%



Elderly Population

- Below County %
- Above or Equal to County %
- No Population/No Data

Percentage by County

Greene County	13.61%
Miami County	15.35%
Montgomery County	15.14%
Warren County	10.78%

N

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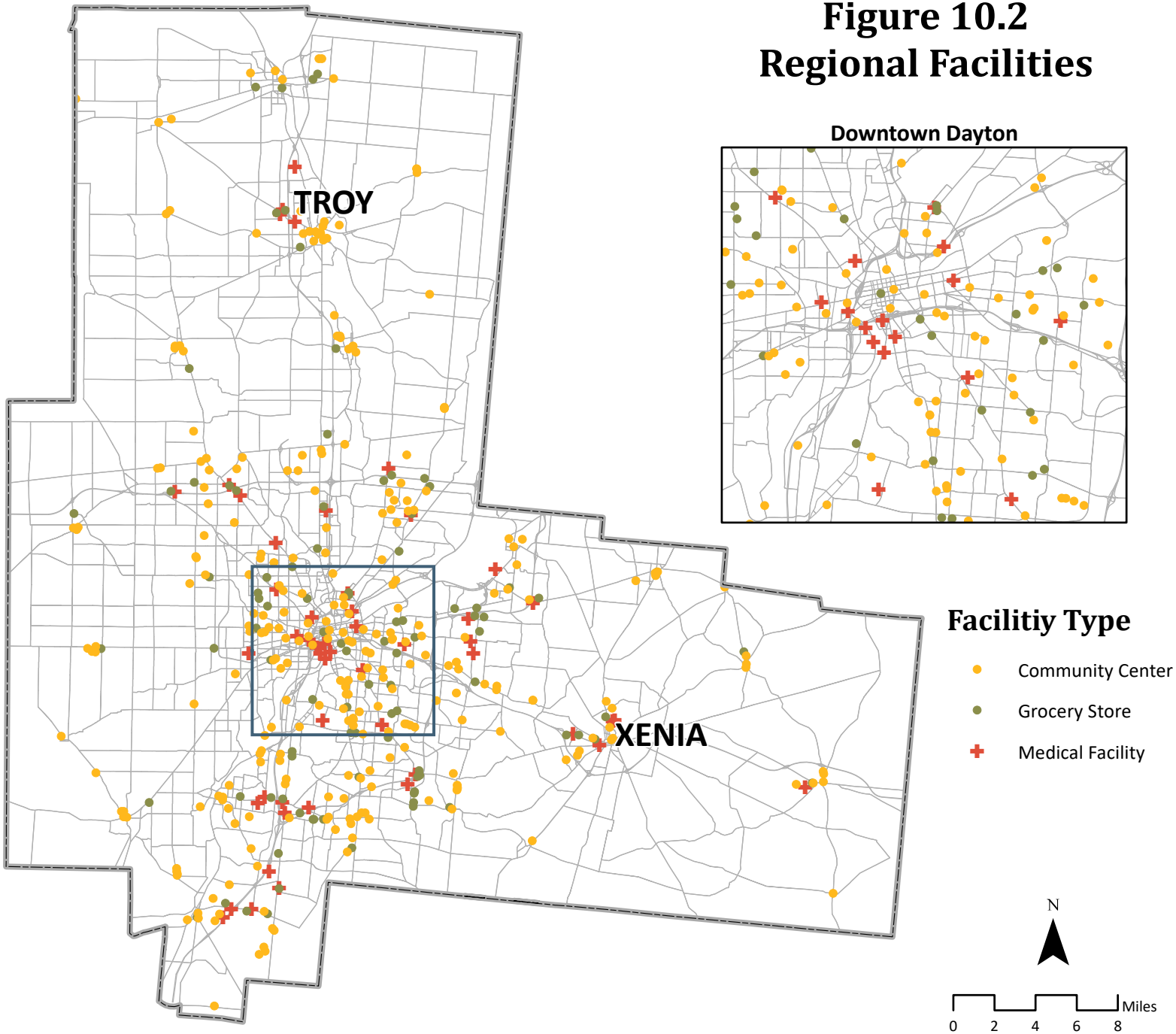
Figure 10.2
Regional Facilities



Note: In 2018 Good Samaritan Hospital closed.

Distribution of Target Areas

Using the county's threshold for each target population, TAZs were examined and coded as either "Above County Average" or "Below County Average." It is important to note here that a specific TAZ could be a target area for several target population groups.

MVRPC used GIS to produce a series of maps showing the geographic distribution of target areas for each population group in the Region. The maps are shown in Figure 10.1.

- Minority Population Distribution — Minority areas are concentrated around urban areas or cities.
- Distribution of People in Poverty — The distribution of people in poverty revealed a high concentration in the central city areas of Montgomery County. Greene and Miami Counties also showed the highest concentrations in the central city areas, as well as selected rural areas.
- Disabled Population Distribution — The distribution of the disabled population showed no particular pattern. Disabled populations are spread throughout the entire Region.
- Elderly Population Distribution — No strong patterns were identified with the elderly population, aside from a slight but perceptible lack of concentration near urban centers. In general, the elderly population appears to be spread evenly over the Region.
- Hispanic Population Distribution — In contrast with the distribution patterns for the minority population and people in poverty, the Hispanic population in the Region appears to be located away from city centers and closer to rural areas and large employment centers, particularly Wright Patterson Air Force Base.
- Zero-Car Households Distribution — The distribution of households with no cars shows greater concentration patterns in city centers.

10.6 Community Impact Analysis

MVRPC conducted various technical analyses for the 2050 LRTP to address EJ issues, recognizing that no single measurement can determine whether disproportionate adverse impacts exist or not. Specifically, MVRPC analyzed: 1) Accessibility to Basic Services; 2) Home-Based-Work (HBW) Travel Times; and 3) Transit and Regional Bikeway Accessibility. The purpose of these analyses was to determine if target areas are adversely affected by the Plan, compared to non-target areas, for vulnerable population groups. The following sections provide information on each analysis's methodology.

Accessibility to Basic Services

MVRPC conducted the accessibility analysis by measuring travel time from TAZs to basic service facilities for driving and transit, and from Micro Analysis Zones (MAZs) based on U.S. Census blocks to basic service facilities for walking. The facilities included were grocery stores, medical centers, and community centers (including schools) located in the Region based on inventories conducted in the summer of 2018. The analysis will be repeated periodically as facilities' locations shift over time and the location of the facility is the principal determinant of accessibility. The locations of basic service facilities considered in the analysis can be seen in Figure 10.2.

MVRPC calculated the travel time from each TAZ to the closest facility using the Transportation Demand Forecasting Model (TDFM) with 2010 based conditions, and walking time from each MAZ was calculated assuming a constant walking speed of 3 mph. TAZs and MAZs were then determined to have driving, transit, or walking access to each facility type based on travel time thresholds. From there, the percentage of each target group with access was compared to the percentage of the general population with access for each travel mode and each facility type.

Identifying Basic Service Facilities

MVRPC developed the following criteria to determine which facilities would be included in the analysis.

Grocery Stores — Grocery stores can come in many different forms, so a set of criteria was developed to standardize whether a particular store should be included. The following criteria were used:

- The store must stock fresh produce;
- The store must have a deli and/or stock butchered meats;
- The store must carry basic pantry items, like rice and canned goods;
- The store must carry staples including milk, bread, and eggs; and
- The store must meet basic sanitation requirements.

Medical Centers — Hospitals and urgent care centers were included in the medical center analysis. Urgent care centers were defined as follows:

- Hours which extend beyond the business day (after 5 p.m. and/or some weekend services);
- Provide basic emergency services, such as stitches; and
- Staffed by a doctor.

Additionally, community health centers focused on providing healthcare to low-income and underserved populations were also included in the analysis.

Community Centers — The community center analysis was intended to capture locations which contribute to the civic, social, and physical health of a community. Public schools were included for their common usage as a meeting space for local events. Libraries often hold classes and programs for community enrichment and vitality, in addition to their everyday functions. Cultural centers, recreation centers, and senior centers were also included for their contributions to community cohesion and vitality.

Accessibility Thresholds

- Walking Threshold:
  - Accessible: 15 minutes
- Transit Threshold:
  - Includes access/egress, waiting, transfers, and in-vehicle times
  - Accessible for Grocery Stores and Medical Centers: 45 minutes (equivalent to 10 minutes driving in Travel Demand Model)
  - Accessible for Schools and Community Centers: 30 minutes
- Driving Threshold:
  - Accessible: 10 minutes

Figure 10.3
Grocery Store Accessibility

Percentage of Population with Access			
	Driving	Transit	Walking
General Population	96.75%	56.25%	21.89%
Poverty	98.92%	71.63%	29.08%
Disability	97.43%	61.91%	24.22%
Zero-Car Households	99.11%	76.39%	30.52%
Minority	99.54%	79.72%	26.50%
Hispanic	98.38%	66.38%	27.53%
Elderly	96.90%	56.19%	20.83%

Source: U.S. Census 2010, ACS 2008-2012, and MVRPC

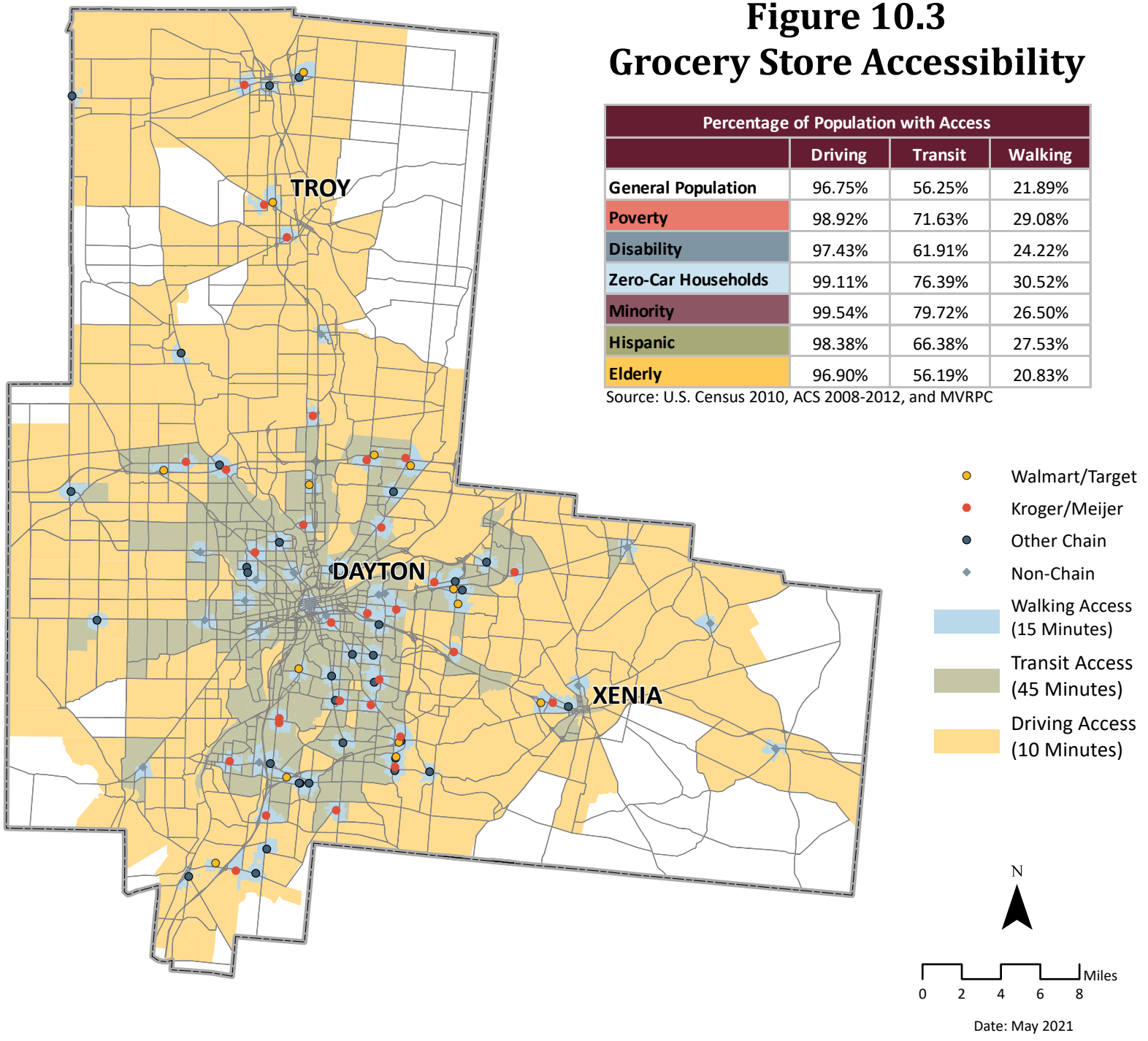


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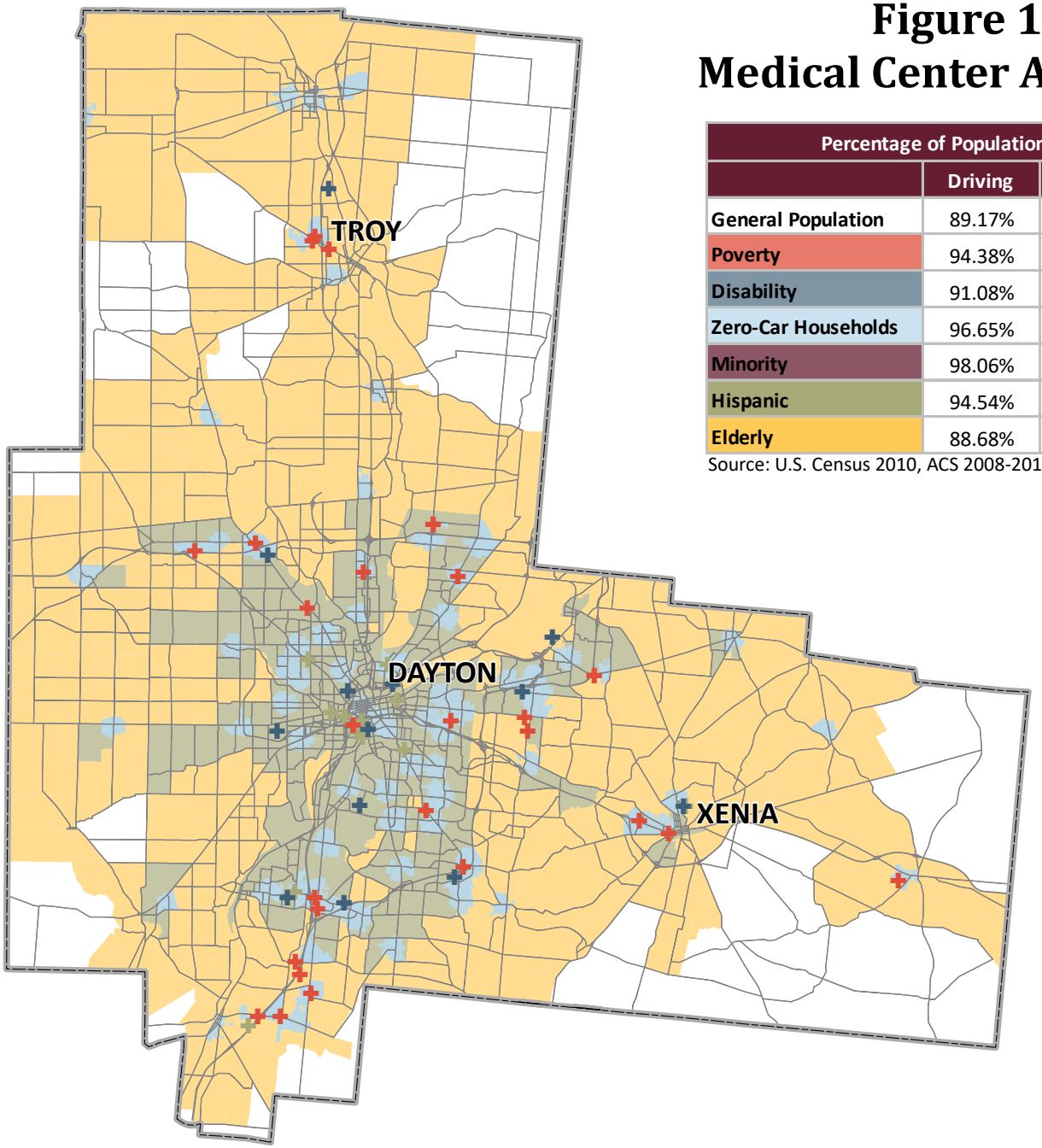
Figure 10.4
Medical Center Accessibility

Percentage of Population with Access			
	Driving	Transit	Walking
General Population	89.17%	50.15%	8.72%
Poverty	94.38%	64.72%	13.01%
Disability	91.08%	56.17%	10.64%
Zero-Car Households	96.65%	70.99%	17.03%
Minority	98.06%	76.07%	11.58%
Hispanic	94.54%	58.83%	10.97%
Elderly	88.68%	50.34%	9.66%

Source: U.S. Census 2010, ACS 2008-2012, and MVRPC



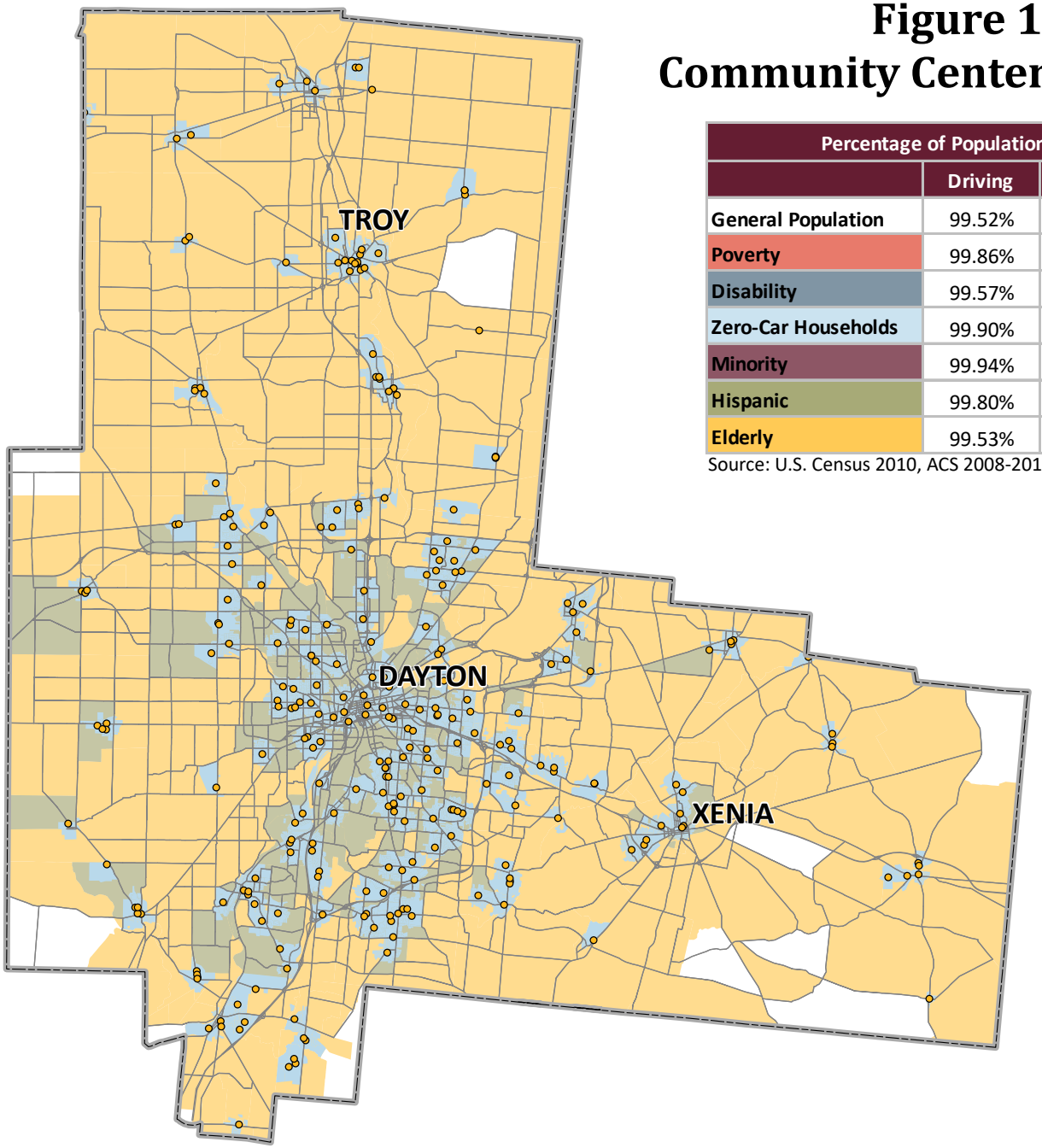
Date: May 2021

MVRPC

Figure 10.5
Community Center Accessibility

Percentage of Population with Access			
	Driving	Transit	Walking
General Population	99.52%	50.07%	46.87%
Poverty	99.86%	65.47%	56.67%
Disability	99.57%	57.27%	52.02%
Zero-Car Households	99.90%	72.60%	58.86%
Minority	99.94%	70.91%	51.09%
Hispanic	99.80%	57.79%	50.23%
Elderly	99.53%	50.88%	46.98%

Source: U.S. Census 2010, ACS 2008-2012, and MVRPC



Date: May 2021

Results

MVRPC generated maps, shown in Figures 10.3-10.5 above, with TAZs and MAZs highlighted which are within accessibility thresholds for each facility type and travel mode. Each figure also contains a table showing the percentage of the general population and target populations with access to each facility type. In general, all examined populations have better accessibility than the general population except for the elderly, whose accessibility closely resembles that of the general population due to a similar geographic distribution. Rural populations have more gaps in accessibility than urban and suburban populations.

Grocery Store Accessibility — All populations have greater than 95% driving access, greater than 55% transit access, and greater than 20% walking access. The groups with the most access per mode are minority for driving and transit (99.5% and 80%, respectively), and zero-car households for walking (31%).

Rural populations tend to have lower access than urban and suburban populations to grocery stores. Driving access tapers off on the outskirts of the region (e.g. western Greene and western Miami counties), especially outside the Interstate 75 corridor. Target populations living in rural communities, especially those unable to drive, may experience difficulty shopping for food.

It is also notable that accessibility would decrease significantly if only major grocery chains were included in the analysis.

Medical Center Accessibility — All target groups have greater transit and walking access than the general population. All populations have greater than 88% driving access, greater than 50% transit access, and greater than 8% walking access. The groups with the most access per mode are minority for driving and transit (98% and 76%, respectively), and zero-car households for walking (17%).

Medical center access for rural communities is the lowest of any facility type. Low driving access extends into some exurban communities such as Germantown and Brookville.

Community Center Accessibility — All target groups have greater access for all modes than the general population. All populations have greater than 99.5% driving access, greater than 50% transit access, and greater than 46% walking access. The groups with the most access per mode are minority for driving (99.94%), and zero-car households for transit and walking (73% and 59%, respectively).

Community centers and schools enjoy a wider geographic coverage than the other facility types. Still, there are accessibility gaps, even for driving, in less-populated parts of the region.

Travel Time to Work

MVRPC analyzed travel time to work (HBW Trips) as a second community impact evaluation of the 2050 LRTP. This evaluation identifies whether adverse impacts exist regarding the travel time to work between target areas and non-target areas, with respect to employment locations as a result of the Plan.

The average travel time to work for each TAZ was derived using MVRPC's TDFM for all three scenarios (2010 Base, 2050 E+C, and 2050 Plan). The average HBW travel time for each TAZ was calculated for target areas

for all population groups and the general population. The results of the analysis can be seen in Table 10.2 below.

Table 10.2 — Average Travel Time to Work by EJ Status in Minutes

	2010	2050 E+C	2050 Plan
General Population	9.7	12.6	12.5
People in Poverty	9.6	12.6	12.3
Disabled Population	9.5	12.5	12.3
Zero-Car Households	9.6	12.5	12.3
Minority Population	9.7	12.4	12.3
Hispanic Population	9.5	12.3	12.1
Elderly Population	**10.0**	**13.0**	**12.9**

Source: MVRPC

The differences between the target areas and the general population in the Region, with respect to HBW travel time, are consistent (less than or equal to the general population's travel time for target areas) for all population groups in each scenario, except for the elderly population. A comparison of HBW travel times between the 2050 E+C and 2050 Plan scenarios reveals that implementation of the 2050 LRTP will decrease HBW travel times for all population groups.

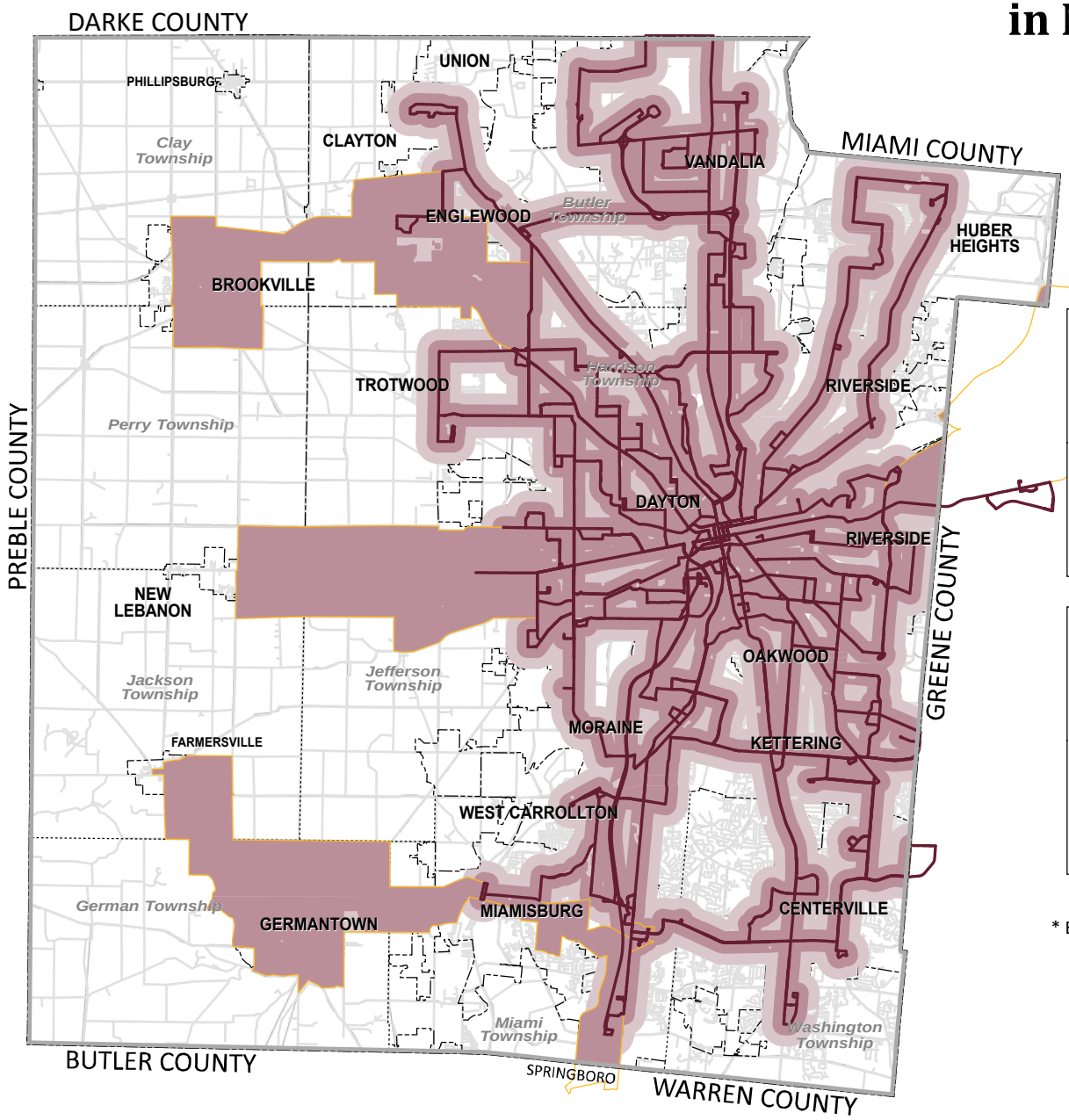
The analysis of the average travel time to work in the Region indicates that target areas are favorably situated as compared to non-target areas in terms of travel time to work, aside from the elderly target areas. Further, the analysis shows that all target areas will benefit as much or more than non-target areas as a result of the 2050 LRTP. Given that the elderly are less likely to work the more their age affects their mobility, HBW travel times are not likely to be seen as a concern by individuals (unlike, for example, access to shopping centers and hospitals discussed above). It is therefore fair to say that there are no significant adverse impacts on target areas compared to non-target areas.

Transit Accessibility Analysis

MVRPC conducted a Transit Accessibility Analysis as a third measure of community impact evaluation of the 2050 LRTP. The analysis was conducted using GIS to identify how much access each target population group has to public transit in the Region. Further, this analysis evaluates how much transit access various target population groups have in comparison to the overall population.

With the exception of limited portions of Greene County (Wright Patterson Air Force Base and Wright State University), Montgomery County is the only County in the MPO area that is served by regularly scheduled fixed transit routes through the Greater Dayton Regional Transit Authority (GDRTA). Therefore, the analysis in this section focuses on Montgomery County (see Figure 10.6). Miami and Greene counties have demand-responsive transit services that are open to the general public.

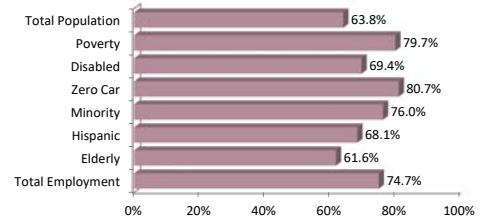
Figure 10.6
Transit Accessibility in Montgomery County



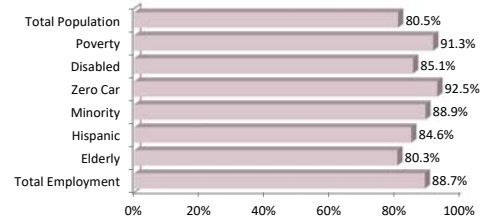
Service Areas

- GDRTA 2020 Transit Routes
- RTA Connect Zone
- 1/4 Mile Buffer
- 1/2 Mile Buffer

Percentage of Population within 1/4-Mile of GDRTA Transit Route



Percentage of Population within 1/2-Mile of GDRTA Transit Route



* Express Routes and Local School Routes are not included.

Source: GDRTA, U.S. Census 2010, ACS 2008-2012 and MVRPC

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0 2 4 6 8 Miles

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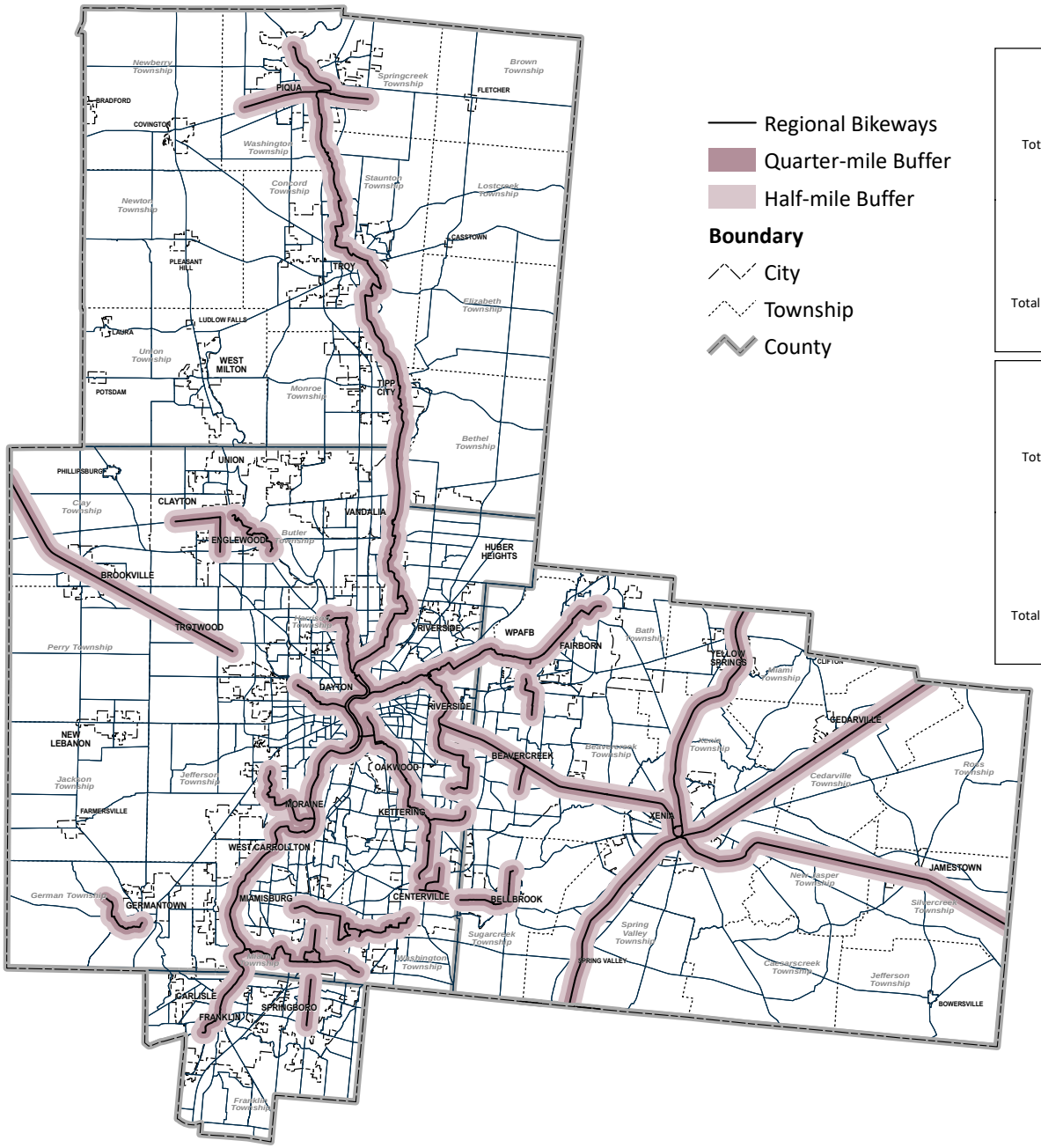
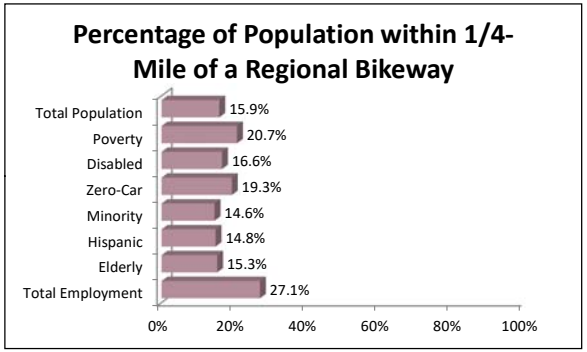
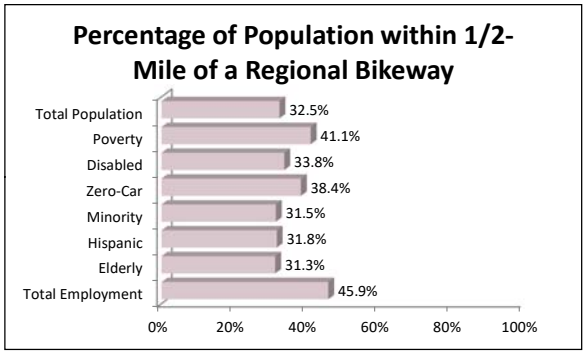
Figure 10.7
Regional Bikeway Accessibility







Source: U.S. Census 2010,
ACS 2008-2012 and MVRPC

Date: May 2021

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0 2 4 6 8 Miles

Due to the close proximity of transit stop locations — less than ¼ mile apart on most routes (with the exception of express routes) — and relatively comprehensive time/location coverage (with the exception of local school routes), bus routes, not bus stops, were used as the basis for the analysis. The analysis utilized the updated 2020 GDRTA transit routes and RTA Connect Zones. GDRTA began using RTA Connect service in 2018, which designates Connect Zones within which ride-hailing service can be utilized to connect to a bus or travel within a zone for the cost of bus fare.

Transit route buffers were overlaid on TAZ and census block boundaries to determine the area covered by the buffer with respect to the overall population and target population groups. RTA Connect Zones were then added to the buffers to account for service provided within the zones. Using the assumptions that population is evenly spread throughout underlying census blocks and target population proportions are consistent within TAZs, the percentage of the general population and target population groups covered in the combined buffer was calculated.

The results of the analysis are presented in two charts in Figure 10.6. The first chart shows the percentage of the general population and target population groups within ¼ mile of a transit route. The second chart shows percentages within ½ mile.

The results reveal that 63.8% of the total population of Montgomery County lives within ¼ mile and 80.5% within ½ mile of a transit route. It was also revealed that high percentages of target populations are covered by public transportation. Further, the results show that target population groups, with the exception of the elderly, are better served than the overall population in both the ¼ mile and ½ mile buffer analyses. For example, 76.0% of minorities, 79.7% of persons living in poverty, 69.4% of persons with a disability, 68.1% of persons of Hispanic origin, and 80.7% of zero car households live within ¼ mile of a transit route, compared to 63.8% for the general population in the same area. The elderly population is slightly less served than the general population at 61.6%, but is a much more evenly spread demographic throughout the county.

The transit accessibility analysis indicates that, in general, target population groups have better accessibility to transit compared to the general population, which leads to the conclusion that there are no adverse impacts regarding target populations.

Regional Bikeway Accessibility Analysis

The importance of measuring the accessibility of the Region's bikeways for target population groups has become an important focus as investment in the system has increased over time. Unlike GDRTA's fixed route transit service, the regional bikeway network extends throughout the MPO Region and continues to grow as new sections are designed and constructed. Only existing regional bikeways — bike paths or bike routes — were included in the analysis.

Bike path facilities are typically grade separated, paved trails intended for non-motorized vehicles; while bike routes are designated portions of the surface roadway network that serve both motorized and non-motorized vehicles. Bike routes are typically identified through signs and/or pavement markings.

Currently there are roughly 225 miles of bikeways in the Region with approximately 14 miles of bikeways added to the Region since 2016.

As in the transit analysis, regional bikeway buffers were overlaid on TAZ and census block boundaries to determine the area covered by the buffer with respect to overall population and target population groups. Using the assumptions that population is evenly spread throughout underlying census blocks and target population proportions are consistent within TAZs, the percentage of the general population and target population groups covered in the buffer was calculated.

The results of the analysis are presented in two charts in Figure 10.7. The first chart shows the percentage of the general population and target population groups within ¼ mile of a regional bikeway. The second chart shows percentages within ½ mile.

The analysis shows that only 15.9% and 32.5% of the general population live within ¼ and ½ mile of a regional bikeway, respectively. Access for target populations is either similar to or higher than the general population, with the largest deficit being the 1.2% difference between 31.3% Elderly access at the ½ mile distance and 32.5% access for the general population. All other deficits are within 1% of the general population. Poverty and Zero-Car populations experience the greatest access, with 20.7% and 19.3% at the ¼ mile distance, and 41.1% and 38.4% at ½ mile, respectively. In addition, 45.9% of the Region's total employment exists within ½ mile of a regional bikeway.

The Regional bikeway accessibility analysis indicates that, in general, target population groups have comparable or better accessibility to regional bikeway facilities as compared to the general population, which leads to the conclusion that there are no adverse impacts regarding target populations.

10.7 Equity Considerations

On October 2020, the MVRPC Board of Directors passed a resolution ensuring equity, diversity, and inclusion in all MVRPC staff, committee and Board of Director's actions denouncing all forms of discrimination and racism as it works to increase equity, diversity, and inclusion in the Region's communities.

Project Evaluation System Update

In 2019, and in preparation for the Long Range Transportation Plan update, MVRPC staff worked with a committee of 15 MPO members to conduct a major review and update the Project Evaluation System (PES). The motivation behind the 2019 update effort was to better align the criteria with the type of projects that are currently being funded; to address member concerns; and to incorporate equity criteria and the performance management approach that is now the foundation of the Federal Surface Transportation legislation.

With respect to equity, points are awarded based on a community's income level with more points being awarded to projects in low income communities. The revised criteria will be used for all MVRPC solicitation and funding processes including the LRTP and the STP/CMAQ/TA solicitation starting in CY 2020.

Institute for Livable and Equitable Communities

Since its inception in 2019, the Institute for Livable and Equitable Communities has placed a deliberate focus on livability and equity, launching programs and transforming systems to build a community where people of all ages, races, incomes, and abilities can thrive. The Institute convenes and works with key regional partners to create a long-term, multi-faceted effort addressing nine critical domains proven to enhance livability and equity in communities including:

- Education;
- Entrepreneurship, Employment and Volunteering;
- Engagement;
- Health and Environment;
- Housing;
- Neighborhood;
- Safety and Justice;
- Technology and Connectivity; and
- Transportation.

As we continue to stand up the Institute, MVRPC will incorporate livability and equity in all of our work products and how we conduct planning and agency operations. We will engage representatives from local jurisdictions with community and business organizations in a variety of working groups that are organized around the domains. Through discussions, programs, and projects, the Institute will be a long term resource for creating livable and equitable communities in the Miami Valley.

10.8 Environmental Justice and Public Participation

Refer to Chapter 11 — Public Participation and Consultation, for a discussion of additional public participation efforts to reach Environmental Justice populations.

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CHAPTER 11

PUBLIC PARTICIPATION AND CONSULTATION

11.1 Overview

MVRPC's integration of a more proactive approach in transportation planning is accomplished through the public participation process. The process is made up of multiple components, including consultation with the TAC and MVRPC Board of Directors, the LRTP sponsors and stakeholders, and general outreach to the public. Additionally, community outreach efforts were expanded in an attempt to reach disadvantaged populations.

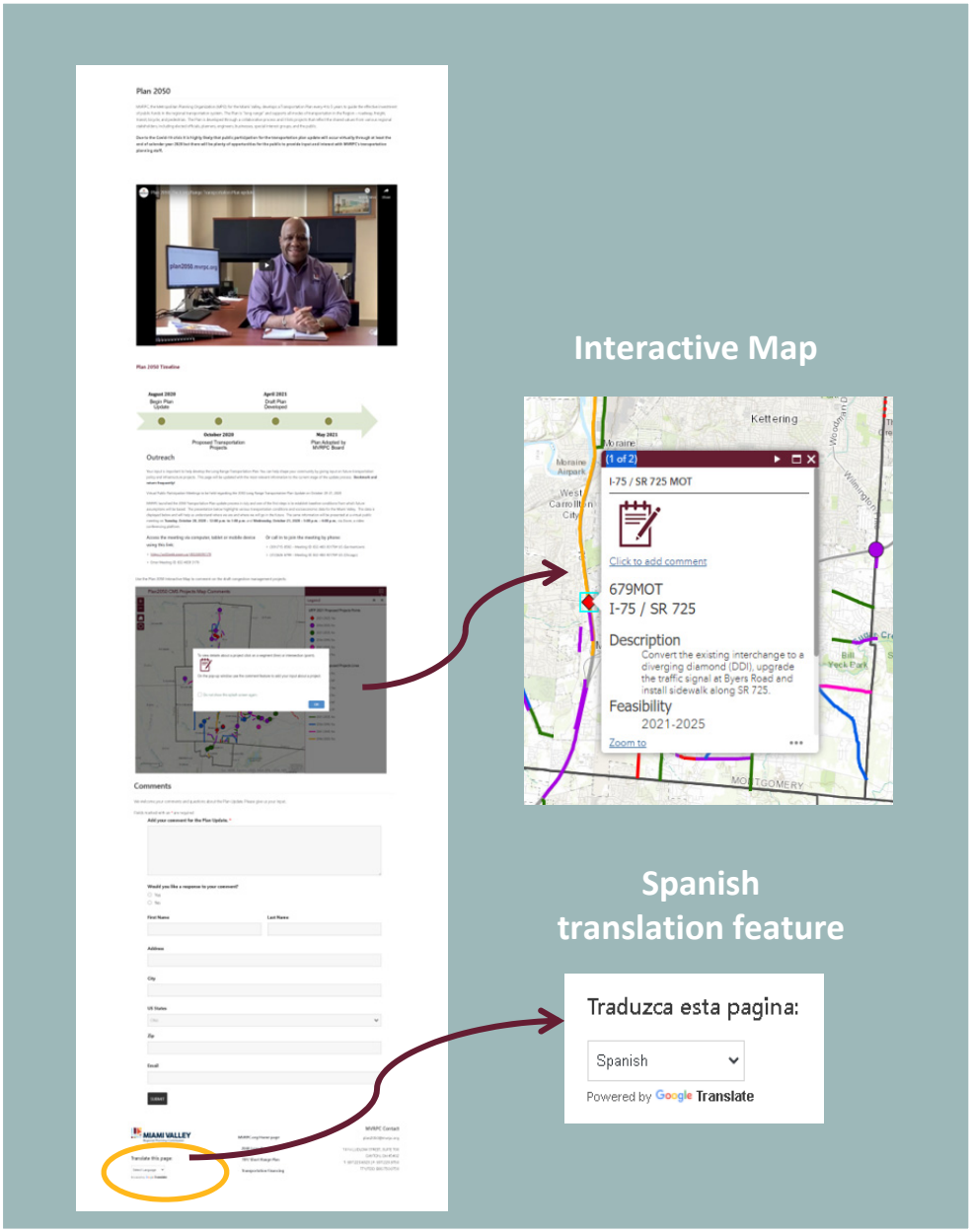
As per the FAST Act, a MPO needs to develop and use a documented public participation plan that defines a process for providing citizens, affected public agencies, representatives of public transportation employees, freight shippers, providers of freight transportation services, private providers of transportation, etc. with reasonable opportunities to be involved in the metropolitan transportation planning process. MVRPC last updated its *Public Participation Policy* in June 2020. The policy details the LRTP public participation requirements and complies with current planning regulations and the FAST Act statutory provisions. MVRPC made an extensive public outreach effort to solicit input from the general public and special interest groups in order to increase public participation in the 2050 LRTP update process. The policy's key items include an expanded public participation notification list, use of technology to enhance communication with the public (website applications and social media), and efforts to reach environmental justice populations.

Is also important to note that the Plan update took place during the Covid-19 pandemic, as such public participation was primarily conducted in a virtual environment by using Zoom meetings and relying on plan2050.mvrpc.org to communicate information. However, recognizing that not every person has access or is proficient with the internet, other methods such as reviewing information at the MVRPC offices and the use of postage-paid mail back comments cards were also employed.

11.2 Plan2050.mvrpc.org Webpage

For the May 2021 Update of the 2050 LRTP, MVRPC created a webpage solely dedicated to the update effort and promoted its use through public notices, advertising, and social media as a one-stop shop for all items related to the Plan update. The webpage launched in June 2020 and was available throughout the update process and included the update timeline, information presented at various meetings, comment card, and an interactive map with the ability to comment on individual projects on the map. Figure 11.1 depicts the various webpage features including the ability to view website content in Spanish by using an online translator.

Figure 11.1 — Features and Content: plan2050.mvrpc.org



11.3 Public Participation Meetings

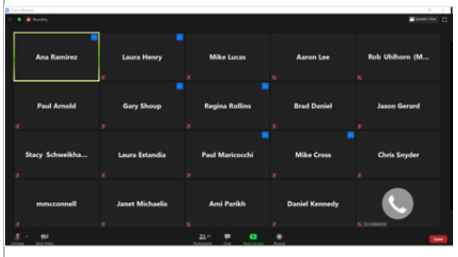
Beginning in August 2020, the public was involved in each step of the 2050 LRTP update process through the use of various tools. Virtual public participation meetings were held to present the latest information pertaining to the update and MVRPC staff was available at the meetings to answer questions. Comments received at the meetings were recorded and reference was made to the online comment cards. MVRPC's website was updated frequently to provide the latest information and an online version of the comment card was made available to receive comments 24/7 on any of the information provided. The same information was also made available at MVRPC's offices during the comment period for each meeting.

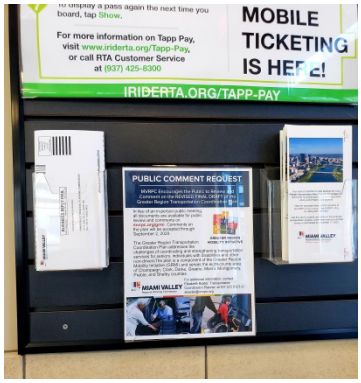
The first phase of the public participation process involved hosting a virtual public participation meeting in August 2020 to provide transportation-related background information used in the development of the LRTP, most notably related to expanding the plan horizon to 2050. The second phase included presenting the draft list of multimodal transportation projects in two virtual participation meetings in October 2020.

Finally, the last phase of public participation took place in April of 2021, through a virtual public meeting format, to present the final draft 2050 LRTP including the findings of various LRTP analyses. Comments received at each meeting were presented to the TAC and the Board of Directors prior to action on LRTP related items.

MVRPC's 2050 Long Range Transportation Plan – Public Participation Summary report provides comprehensive information and documentation regarding the public participation process, including all the public outreach materials used to promote the meetings, a listing of information presented at the meetings, and all the comments received. Table 11.1 provides a brief summary of each meeting.

Table 11.1 — Public Participation Meeting Summary

Outreach	Contents	Attendance/Comments
August 19, 2020 – 5 to 6 PM, via Zoom		
• Printing public notices in the Dayton Daily News and ¼ page ads in La Mega Nota (English and Spanish) and Dayton Weekly, a minority focus newspaper, announcing the meeting. • Submitting press releases to all local newspapers, television and radio stations – approximately 89 media outlets. • Sending e-mails/letters to individuals and agencies who have requested to be notified about public participation meetings as well as additional agencies/interested parties identified in the FAST Act legislation – over 700 individuals/agencies. • Sending letters and promotional posters to all the public libraries in Montgomery, Greene and Miami Counties. • Displaying promotional posters in English and	• Zoom meeting instructions • 2050 Long Range Transportation Plan Update Overview • 2050 Long Range Transportation Goals • Safety and Congestion Conditions • Alternative Transportation Modes (Passenger & Freight) • Community Impact Assessment • 2050 Land Use and Socioecenomic Projections	• 11 people attended the meeting. • 13 comments were received by various platforms. 

Outreach	Contents	Attendance/Comments
Spanish at the Greater Dayton Regional Transit Authority hubs. • E-mailing promotional posters to Miami County Transit and Greene CATS. • E-mailing promotional posters (English and Spanish versions) to the Latino Connection for distribution. • Announcing the meeting on MVRPC's website. • Promoting the meeting using Twitter and Facebook, including 3 boosted posts. • Posting the information, which was to be presented at the meeting, on plan2050.mvrpc.org along with an online comment card. • Conducting a survey to gauge the Region's satisfaction with the availability and condition of the existing transportation infrastructure and to set priorities for the future.	• Accessibility Analysis for Basic Services • Transportation Performance Management • Smart Mobility	
October 20, 2020 – 5 to 6 PM and October 21, 2020 – 12 to 1 PM, via Zoom		
• Printing public notices in the Dayton Daily News and ¼ page ads in La Mega Nota (English and Spanish) and Dayton Weekly, a minority focus newspaper, announcing the meeting. • Purchasing ads on WDTN, WHIO, Spectrum News, and Spotify. • Submitting press releases to all local newspapers, television and radio stations –- approximately 89 media outlets. • Sending e-mails/letters to individuals and agencies who have requested to be notified about public participation meetings as well as additional agencies/interested parties identified in the FAST Act legislation – over 700 individuals/agencies. • Sending letters and promotional posters to all the public libraries in Montgomery, Greene and Miami Counties. • Displaying promotional posters in English and Spanish at the Greater Dayton Regional Transit Authority hubs. • E-mailing promotional poster to Miami County Transit and Greene CATS. • E-mailing promotional posters (English and Spanish versions) to the Latino Connection for distribution. • Announcing the meeting on MVRPC's website. • Promoting the meeting using Twitter,Facebook, and Instagram including 3 boosted posts. • Posting the information, which was to be	• Zoom meeting instructions • Overview of online project map and online comment card • Draft Congestion Management Projects List and Maps • Transit Service Long Range Plan Assumptions 2021-2050 • Regional Bikeway & Pedestrian Network Project List and Map	• 5 people attended the meetings. • 21 comments were received by various platforms. 

Outreach	Contents	Attendance/Comments
presented at the meeting, on plan2050.mvrpc.org along with an online comment card. • Distributing postage-paid comment cards at all Dayton Metro Library locations and GDRTA hubs–625 cards total.		
April 14, 2021 – 5 to 6 PM, via Zoom		
• Printing public notices in the Dayton Daily News and ¼ page ads in La Mega Nota (English and Spanish) and Dayton Weekly, a minority focus newspaper, announcing the meeting. • Printing ¼ page ad in the Dayton Daily News. • Purchasing ads on YouTube. • Submitting press releases to all local newspapers, television and radio stations – approximately 89 media outlets. • Sending e-mails/letters to individuals and agencies who have requested to be notified about public participation meetings as well as additional agencies/interested parties identified in the FAST Act legislation – over 700 individuals/agencies. • Sending letters and promotional posters to all the public libraries in Montgomery, Greene and Miami Counties. • Displaying promotional posters in English and Spanish at the Greater Dayton Regional Transit Authority hubs. • E-mailing promotional poster to Miami County Transit and Greene CATS. • E-mailing promotional posters (English and Spanish versions) to the Latino Connection for distribution. • Announcing the meeting on MVRPC's website. • Promoting the meeting using Twitter,Facebook, and Instagram including 4 boosted posts. • Posting the information, which was to be presented at the meeting, on plan2050.mvrpc.org along with an online comment card.	• 2050 Long Range Transportation Plan Update Overview • Air Quality • Fiscal Constraint Analyis • Safety and Performance Management • Transportation System and Congestion Analysis • Community Impact Assessment • Environmental Mitigation Analysis • Congestion Management Projects – Transit • Congestion Management Projects – Bikeway and Pedstrian • Congestion Management Projects – Roadway	• 11 people attended the meeting; numerous comments were received at the meeting and through the online comment tools. 

11.4 Community Outreach and Public Participation

In accordance with Executive Order 12898 on Environmental Justice, MVRPC has expanded its public participation to incorporate the regulations required by this order (see Chapter 10). Although MVRPC has historically made efforts towards the requirements of Environmental Justice (EJ), a concerted effort was made to further seek input from traditionally disadvantaged populations and other EJ-target groups and to include them in the public participation process. These efforts included:

- Expanding the mailing list to include EJ and other traditionally disadvantaged populations (low-income, minority, elderly, and disabled);
- Adapting advertising for ease of understanding, including special articles and flyers;
- Expanding advertising to online platforms (e.g. YouTube, Spotify) to reach a more diverse population;
- Adapting public meeting times and locations for accessibility;
- Advertising at GDRTA Hubs and public libraries;
- Purchasing public notices in *La Mega Nota*, an English/Spanish publication, and Dayton Weekly, a minority distribution newspaper;
- Sending public notices to the Latino Connection and East End Community Services Corporation that is then forwarded by email to their membership;
- Offering an English-to-Spanish translator on MVRPC's website; and
- Posting information about upcoming meetings on social networking sites such as Twitter and Facebook.
- Publicizing that parking ticket validation is available for public meetings at the MVRPC offices.

11.5 Participation in Other Public Outreach Efforts

During the 2050 LRTP update cycle, MVRPC staff actively participated and/or attended numerous public participation meetings pertaining to studies and projects on progress throughout the Region. These meetings ranged from stakeholder meetings to public hearings related to various transportation studies, as well as Comprehensive and/or Land Use Plans being developed by member jurisdictions. By attending the meetings, staff members were able to gain a better understanding of the projects and studies and to listen to any concerns that the general public might have regarding the project or study. MVRPC staff were also able to answer any questions that arose in relation to MVRPC's planning activities and the 2050 LRTP.

The following is a partial list of public participation meetings/activities that MVRPC staff attended:

- Corridor Upgrades — Montgomery County US 35 Corridor and Greene County US 35 Corridor;
- IR70/75 Logistics Improvement;
- SR 725 Interchange Improvement;
- North Main Street Safety Study;
- GDRTA Strategic Plan;
- Dayton Airport Master Plan;
- ODOT Access Ohio 2045;
- Walk.Bike.Ohio;
- Drive Ohio;

- Numerous Transportation Safety Studies and Road Safety Audits;
- Greene County Thoroughfare Plan;
- Greene County Trails Master Plan;
- Village of Yellow Springs Active Transportation Plan;
- Dayton Transportation Plan;
- Dayton Large School District Safe Routes to School Plan;
- Dayton Children's Community Health Needs Assessment;
- Alternative Fuel Corridor Designation and Plan;
- Complete Streets Assistance — City of Troy and Village of Yellow Springs; and
- Comprehensive Planning Efforts — City of Bellbrook Downtown Assessment Study, City of Clayton, City of Dayton Choice Neighborhood Plan, City of Dayton Huffman Neighborhood Plan, City of Fairborn Housing Strategy Study, City of Miamisburg Siebert Neighborhood Plan, Dayton Riverfront Plan, City of Troy Downtown Riverfront Strategic Development Plan, Greene County Land Use Plan, Harrison Twp. Forest Park Area Plan, and Miami Twp. Comprehensive Plan.

11.6 Consultation Requirements in the FAST Act

The FAST Act mandates that the MPO consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan. MVRPC's Public Participation contact list has been expanded to include agencies with an interest in the areas of land use management, environmental resources, environmental protection, conservation, and historic preservation. As a result the list now includes nearly 700 agencies and individuals. A subset of individuals representing these groups was also invited to participate in a survey to gauge the Region's satisfaction with the availability and condition of the existing transportation infrastructure and to set priorities for the future at the onset the update process. The results of the survey can be found in the Public Participation Summary.

All contacts are notified and given the opportunity to comment on any transportation program that requires action by the MVRPC Board of Directors, such as the Long Range Transportation Plan and the Transportation Improvement Program.

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APPENDIX A
CONFORMITY INTERAGENCY CONSULTATION

CCS-TCC/MVRPC 2021 Regional Transportation Plan Update
1997 Ozone Standard "Orphan" Areas
Conformity Analysis Summary

Overview:

The Clark County Springfield Transportation Coordinating Committee (CCS-TCC) and the Miami Valley Regional Planning Commission (MVRPC) located within a US EPA designated 1997 Ozone Standard "Orphan" Area are updating the Regional Transportation Plans.

As a 1997 Ozone Standard "orphan area" and consistent with US EPA's November 29, 2018 guidance resulting from the South Coast II Court Case, the MPOs will advance qualitative Transportation Plan transportation conformity determinations.

Affected MPO/Air Quality Areas:

MPO	1997 Ozone Standard Geography	Transportation Plan Update
Dayton / MVRPC	Clark, Greene, Miami, & Montgomery Cos., OH	x
Springfield / CCS-TCC		x

Qualitative Conformity Determination Criteria – 40 CFR 93.109:

- Latest planning assumptions – Each MPO maintains current travel demand model socio-economic variables and highway/transit networks used to develop the MPOs' Transportation Plans. With the 2021 Update each MPO Plan is being extended to year 2050.
- Latest emission model – Should a future quantitative emission analyses be needed, the MPOs and ODOT will use US EPA's MOVES3 emissions software.
- TCMs – The Ohio SIP for the Dayton/Springfield region does not include any TCMs
- Conformity process schedule:
    - Each MPO will conduct a public review of its Final Draft Regional Transportation Plan and 1997 Ozone Standard "Orphan" area conformity determination information consistent with its adopted Public Participation Policy as recorded below. Due to the Covid 19 Pandemic, the public participation meetings will occur virtually.

MPO	MPO LRTP Public Meeting (Comment Period)	MPO Policy Board LRTP Adoption & Conformity Determination Resolution Date
Dayton / MVRPC	4/14/21 (3/24/21 - 4/22/21	5/6/21
Springfield / CCS-TCC	(4/12/21 - 4/26/21)	5/14/21

- MPO Conformity Tests
    - 1997 Standard Ozone "Orphan Area" qualitative conformity determination

Outcomes:

- ODOT and the MPOs listed above request Ohio's Transportation Conformity Interagency Consultation Partners review the information above and provide written concurrence/comments that the documentation herein meets the requirements for advancing **qualitative** 1997 Ozone Standard "Orphan" Area for the 2021 Update of the Regional Transportation Plans conformity determinations.

Concurrence with Approach Documentation:

From: McKenzie, Stewart (FTA) [mailto:Stewart.Mckenzie@dot.gov]
Sent: Monday, January 25, 2021 4:02 PM
To: Ramirez, Ana
Cc: Kane, Mark (FTA)
Subject: RE: 2050 Regional Transportation Plan AQ Interagency Consultation - 1997 Ozone Standard Conformity

Hi Ana,

I am sorry for the delay here. FTA concurs with the proposed approach.

Just so you know, Mark Kane in our office is the planning point of contact for MVRPC.

He is included in this email.

Thanks,
Stewart

From: Maietta, Anthony [mailto:maietta.anthony@epa.gov]
Sent: Friday, January 15, 2021 10:39 AM
To: paul.braun@epa.ohio.gov; Ramirez, Ana; Nino.Brunello@dot.ohio.gov; Jordan.Whisler@dot.ohio.gov; Stemen, Carmen (FHWA); McKenzie, Stewart (FTA); Andy.Johns@dot.gov
Cc: sschmid@clarkcountyohio.gov; ANTHONY.HILL@dot.ohio.gov
Subject: RE: 2050 Regional Transportation Plan AQ Interagency Consultation - 1997 Ozone Standard Conformity

EPA concurs with the approach as well.

Thanks Nino and Ana,

-Tony

Anthony Maietta
EPA Region 5
(312) 353-8777

maietta.anthony@epa.gov

From: paul.braun@epa.ohio.gov <paul.braun@epa.ohio.gov>
Sent: Friday, January 15, 2021 9:31 AM
To: aramirez@mvrpc.org; Nino.Brunello@dot.ohio.gov; Jordan.Whisler@dot.ohio.gov; Stemen, Carmen (FHWA) <carmen.stemen@dot.gov>; Maietta, Anthony <maietta.anthony@epa.gov>; McKenzie, Stewart (FTA) <Stewart.Mckenzie@dot.gov>; Andy.Johns@dot.gov
Cc: sschmid@clarkcountyohio.gov; ANTHONY.HILL@dot.ohio.gov
Subject: RE: 2050 Regional Transportation Plan AQ Interagency Consultation - 1997 Ozone Standard Conformity

I was going to ask about Moves re: the recent change. Seeing this, I have no other comments and concur.

From: Ramirez, Ana <ARamirez@mvrpc.org>
Sent: Friday, January 15, 2021 7:56 AM
To: Brunello, Antonino <Nino.Brunello@dot.ohio.gov>; Whisler, Jordan <Jordan.Whisler@dot.ohio.gov>; Stemen, Carmen (FHWA) <carmen.stemen@dot.gov>; Maietta, Anthony <maietta.anthony@epa.gov>; Braun, Paul <paul.braun@epa.ohio.gov>; McKenzie, Stewart (FTA) <Stewart.Mckenzie@dot.gov>; Andy.Johns@dot.gov
Cc: sschmid@clarkcountyohio.gov; Hill, Anthony <ANTHONY.HILL@dot.ohio.gov>
Subject: RE: 2050 Regional Transportation Plan AQ Interagency Consultation - 1997 Ozone Standard Conformity

Thanks Nino, we will make the change in the document.

From: Nino.Brunello@dot.ohio.gov [mailto:Nino.Brunello@dot.ohio.gov]
Sent: Friday, January 15, 2021 7:52 AM
To: Jordan.Whisler@dot.ohio.gov; Stemen, Carmen (FHWA); Maietta, Anthony; paul.braun@epa.ohio.gov; McKenzie, Stewart (FTA); Andy.Johns@dot.gov
Cc: Ramirez, Ana; sschmid@clarkcountyohio.gov; ANTHONY.HILL@dot.ohio.gov
Subject: RE: 2050 Regional Transportation Plan AQ Interagency Consultation - 1997 Ozone Standard Conformity

Jordan,

If we need to revisit a quantitative analysis, the MOVES2014a software will be replaced by the latest MOVES3 emission model.

Thanks,
Nino

Nino Brunello, P.E.
Transportation Engineer
ODOT Office of Statewide Planning & Research
1980 W. Broad Street, Mail Stop 3280, Columbus, Ohio 43223
C: 614-214-6438
(W:614.752.5742, but currently not responding due to working from home)

transportation.ohio.gov

From: Burkett, Frank (FHWA) [mailto:Frank.Burkett@dot.gov]
Sent: Friday, January 15, 2021 6:39 AM
To: Jordan.Whisler@dot.ohio.gov; Ramirez, Ana; Maietta, Anthony; paul.braun@epa.ohio.gov; Nino.Brunello@dot.ohio.gov; McKenzie, Stewart (FTA); Johns, Andy (FHWA)
Cc: sschmid@clarkcountyohio.gov; ANTHONY.HILL@dot.ohio.gov
Subject: RE: 2050 Regional Transportation Plan AQ Interagency Consultation - 1997 Ozone Standard Conformity

Jordan,

The Ohio Division concurs with the approach.

Frank

Frank Burkett, Senior Planning Specialist
Federal Highway Administration - Ohio Division
200 N. High St. - Rm 328
Columbus, OH 43215
614-280-6838

From: Whisler, Jordan
Sent: Thursday, January 7, 2021 5:58 PM
To: Stemen, Carmen (FHWA) <carmen.stemen@dot.gov>; Maietta, Anthony <maietta.anthony@epa.gov>; Braun, Paul <paul.braun@epa.ohio.gov>; Brunello, Antonino <Nino.Brunello@dot.ohio.gov>; McKenzie, Stewart (FTA) <Stewart.Mckenzie@dot.gov>; Andy.Johns@dot.gov
Cc: aramirez@mvrpc.org; sschmid@clarkcountyohio.gov; Hill, Anthony <ANTHONY.HILL@dot.ohio.gov>
Subject: 2050 Regional Transportation Plan AQ Interagency Consultation - 1997 Ozone Standard Conformity

All,

The Miami Valley Regional Planning Commission (MVRPC), the MPO for the Dayton, Ohio urbanized area and the Clark County-Springfield Transportation Coordinating Committee (CSTCC), the MPO for the Springfield, Ohio urbanized area are completing their four year Transportation Plan updates.

Attached is the proposed approach and schedule for demonstrating Transportation Plan conformity to the 1997 Ozone standards.

Please review this document and respond with comments or concurrence by next Friday January 15, 2021.

Thank you,

Jordan Whisler, AICP
Statewide Planning Manager

ODOT Office of Statewide Planning & Research
1980 W. Broad St., Columbus, Ohio 43223
614.644.8181
transportation.ohio.gov