

## 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.

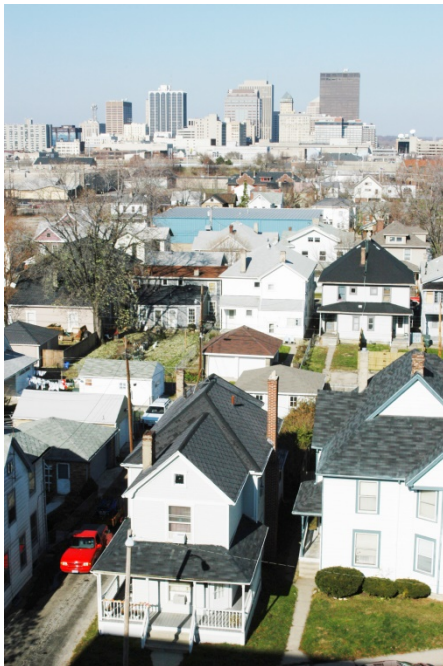
Today, employment is still concentrated in some of the original locations even though the Region's economy has since diversified from its industrial base. Although the current land use patterns in the Region have been shaped more by history than by any inherent physical limitations or advantages, the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

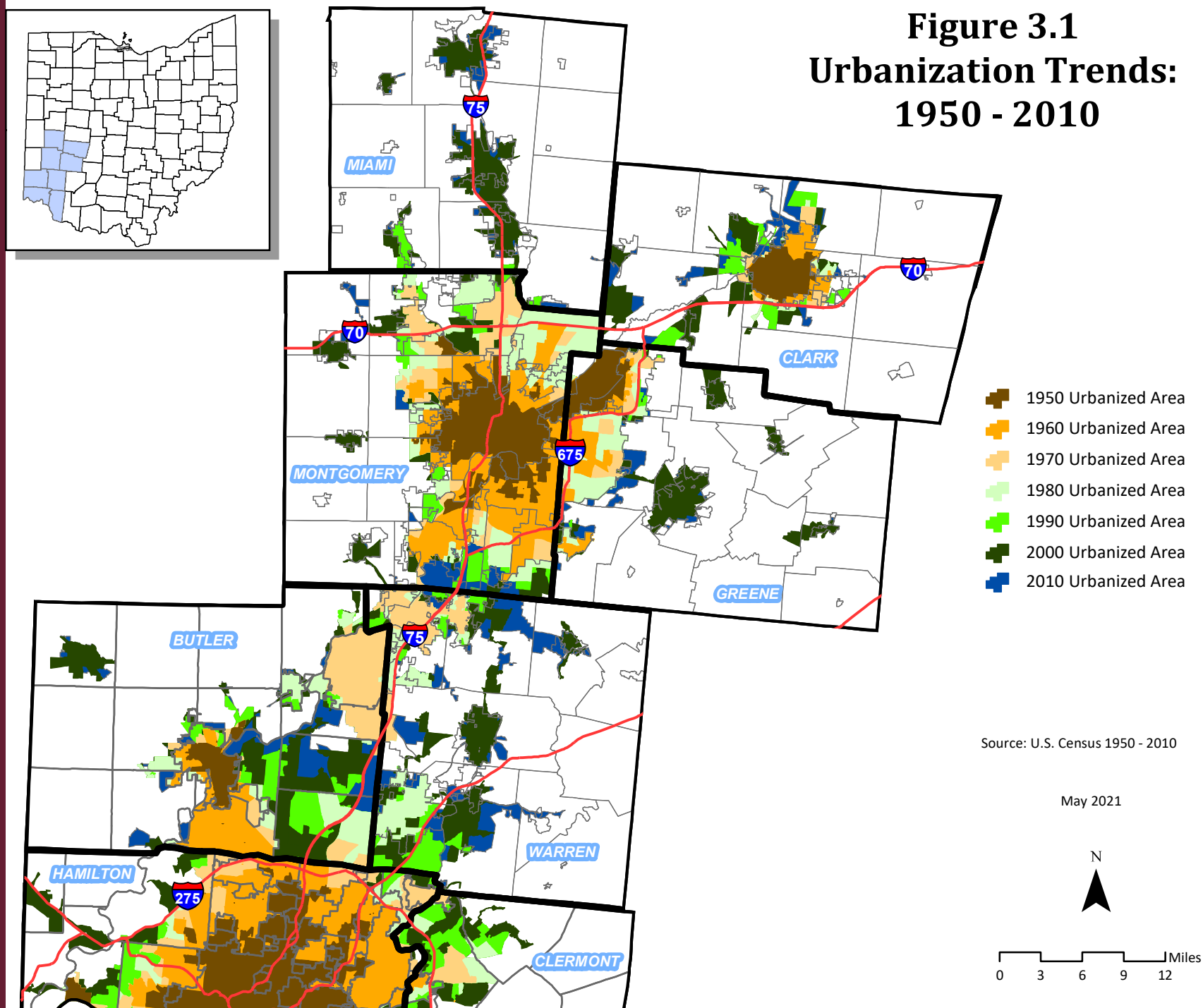
Figure 3.2 shows that residential development in the Region is spread fairly evenly throughout the urbanized area, with high concentrations between the eastern half of Montgomery County and western part



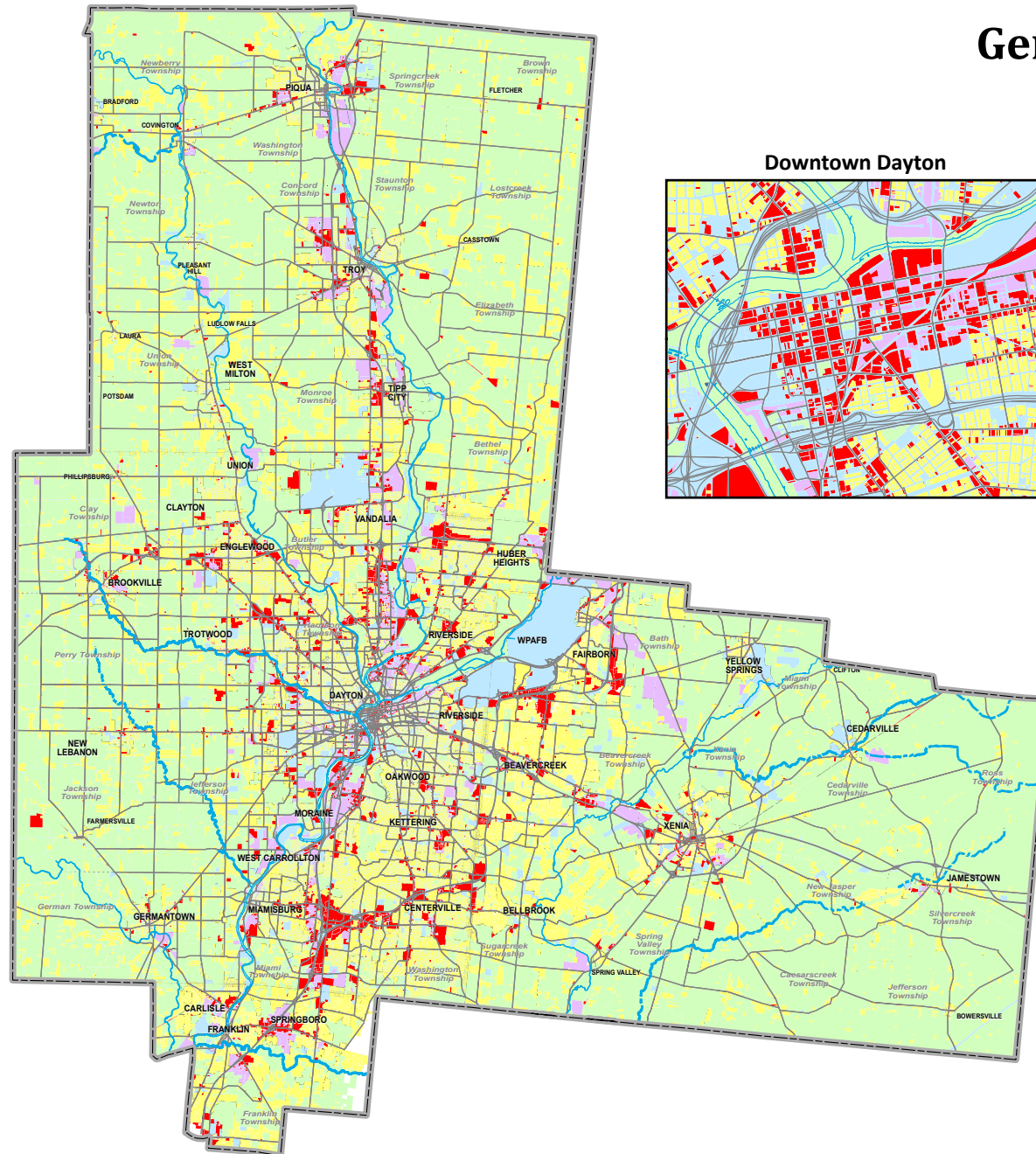
of Greene County and along I-75 in Miami County. Since 2000, increased residential development has occurred in northern Warren County as well. The Region's residential development is largely low-density in character.

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.

# Figure 3.1 Urbanization Trends: 1950 - 2010



## Figure 3.2 Generalized Land Use In 2018



- Commercial
- Industrial
- Institutional
- Residential
- Agricultural / Open Space

Source: MVRPC

May 2021



0 2 4 6 8 Miles



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**

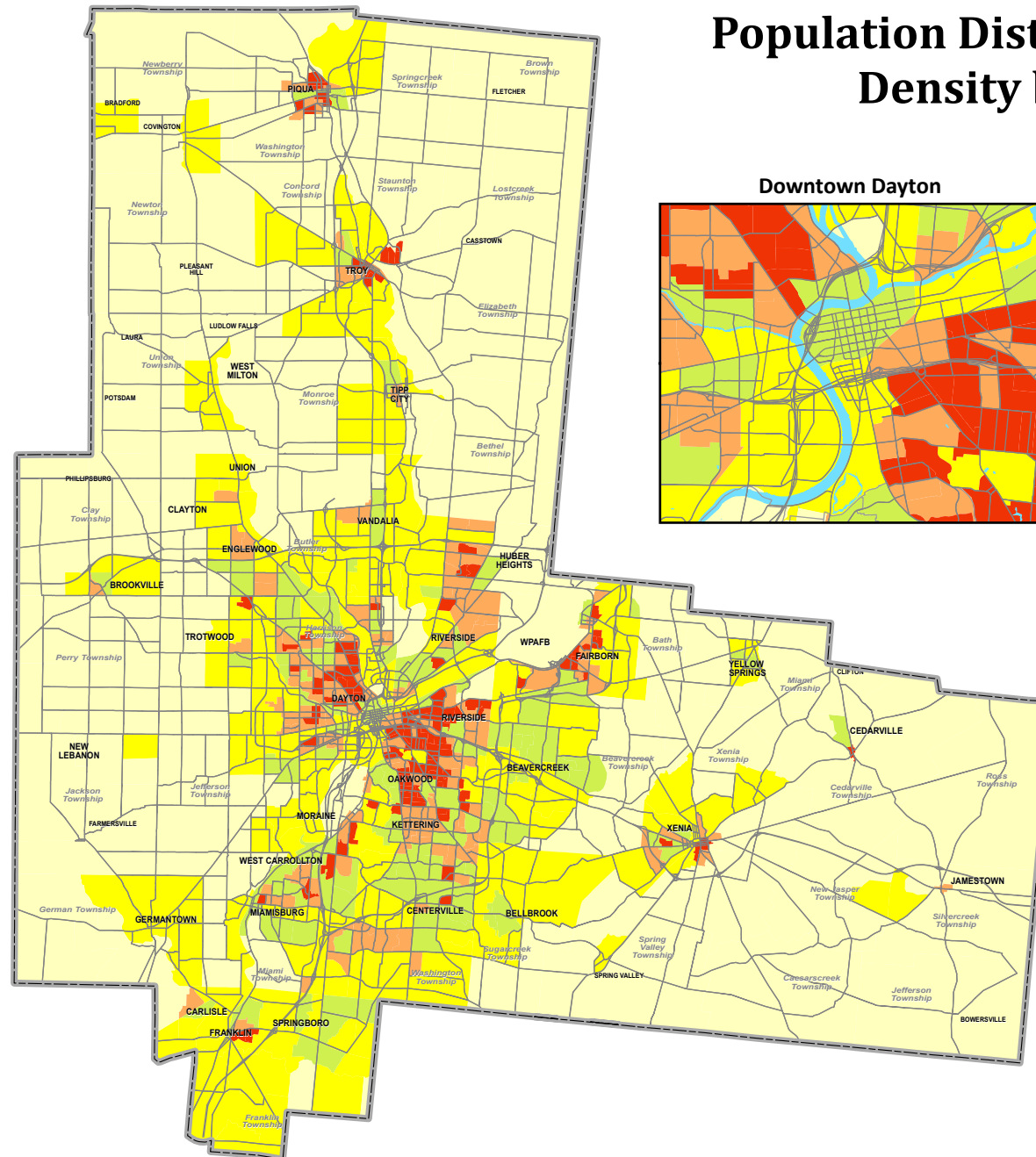
<b>County</b>	<b>Population<sup>1</sup></b>	<b>Households<sup>1</sup></b>	<b>Employment<sup>2</sup></b>
<b>Greene</b>	161,573 (19.0%)	62,770 (18.1%)	97,406 (21.1%)
<b>Miami</b>	102,506 (12.0%)	40,917 (11.8%)	49,607 (10.7%)
<b>Montgomery</b>	535,153 (63.0%)	223,943 (64.7%)	298,018 (64.5%)
<b>Warren*</b>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

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: <sup>1</sup> 2010 Census Summary File 1; <sup>2</sup> MVRPC

# Figure 3.3

## Population Distribution - Population Density by Block Group

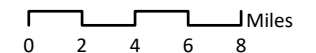


### Population per Square Mile

- 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

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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.

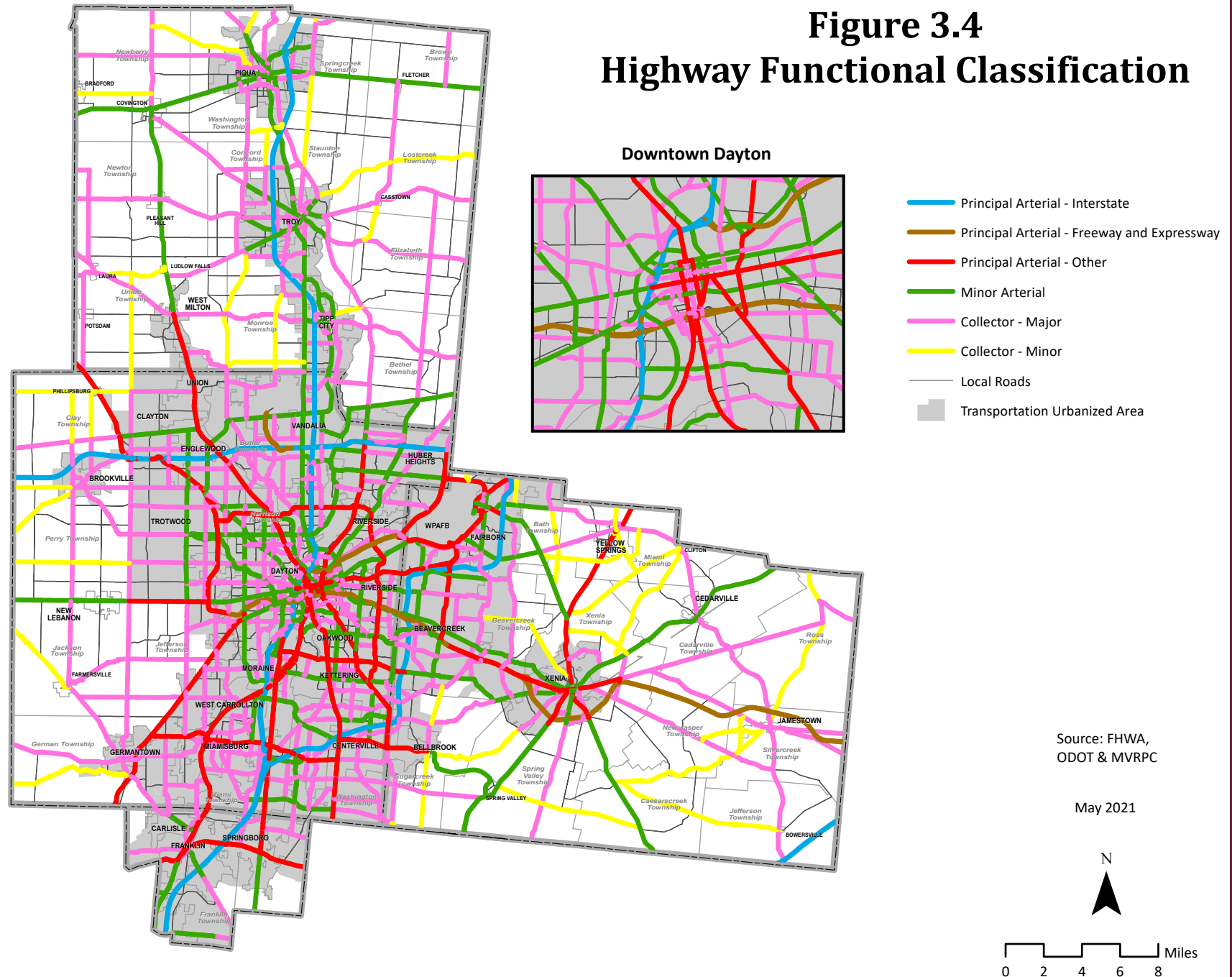
According to FHWA, Functional Classification is the grouping of roads, streets, and highways in a hierarchy based on the type of service they provide. Type of service is defined by combinations of mobility and land access as follows:

- 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.

## Figure 3.4 Highway Functional Classification





**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 multifaceted 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).



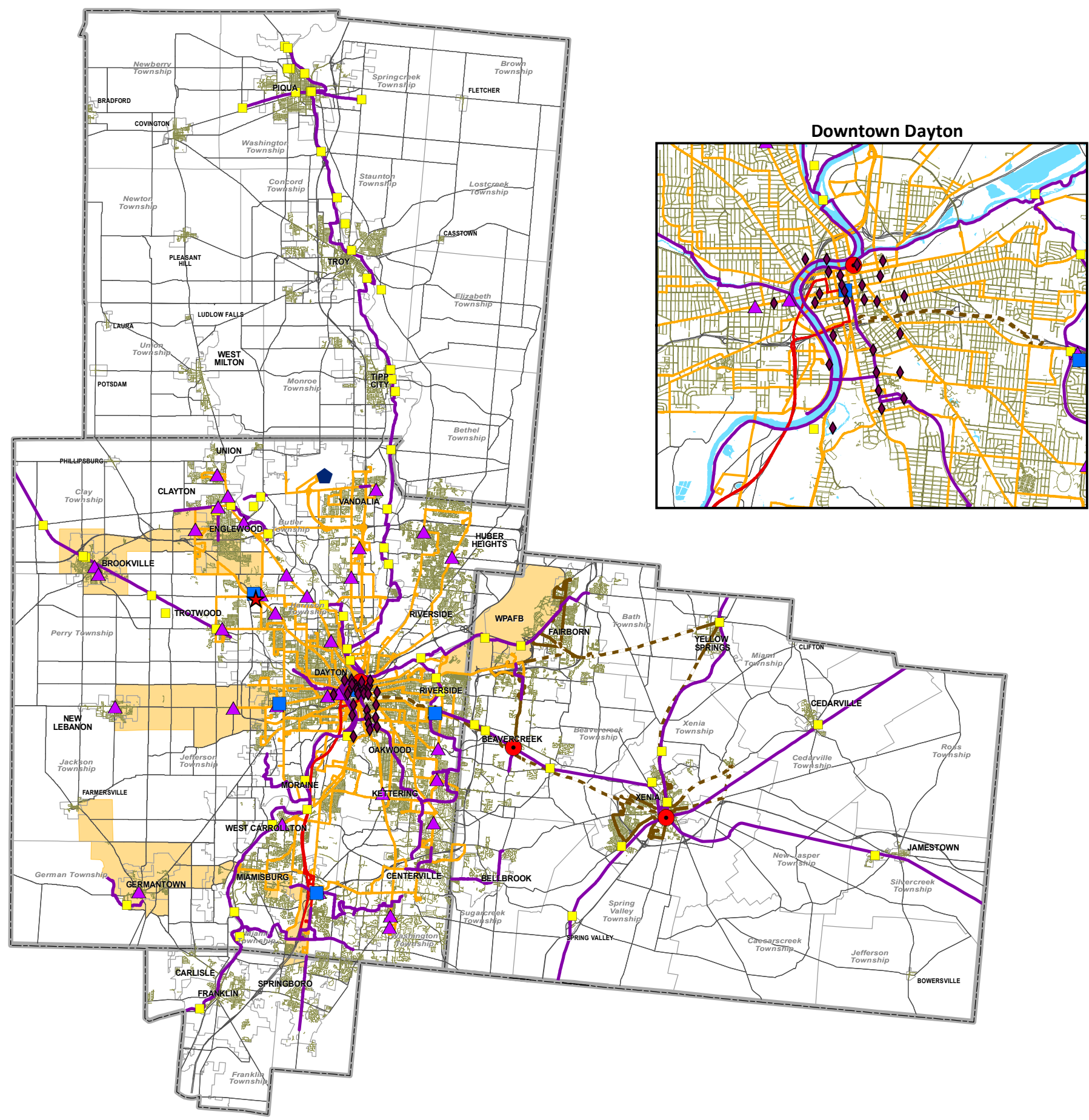
The Dayton International Airport is the focal point of the Region’s air transportation network, including freight. The other airports in the Region are mainly general aviation airports that serve small private planes for personal and agricultural uses.















### **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

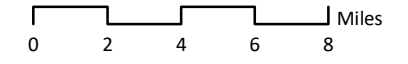
# Figure 3.5 Multimodal Passenger Facilities



-  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







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**

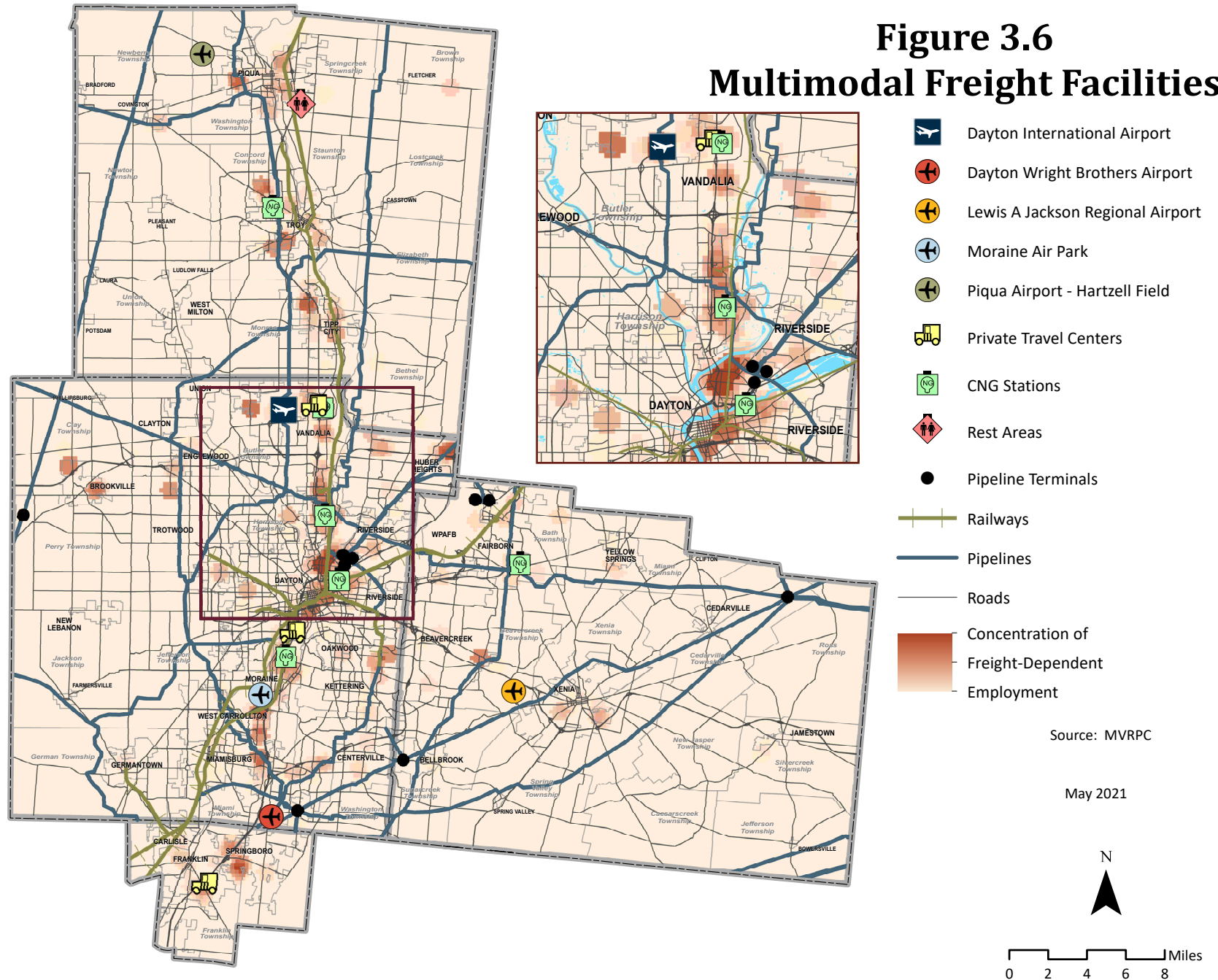
The Dayton-Wright Brothers Airport (MGY) is a general aviation airport located approximately 12 miles south of the City of Dayton, on State Route 741. I-75 allows easy access to and from the airport. The Dayton-Wright Brothers Airport covers an area of 541 acres which contains one asphalt paved runway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

## Figure 3.6 Multimodal Freight Facilities



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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<sup>1</sup>, 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.

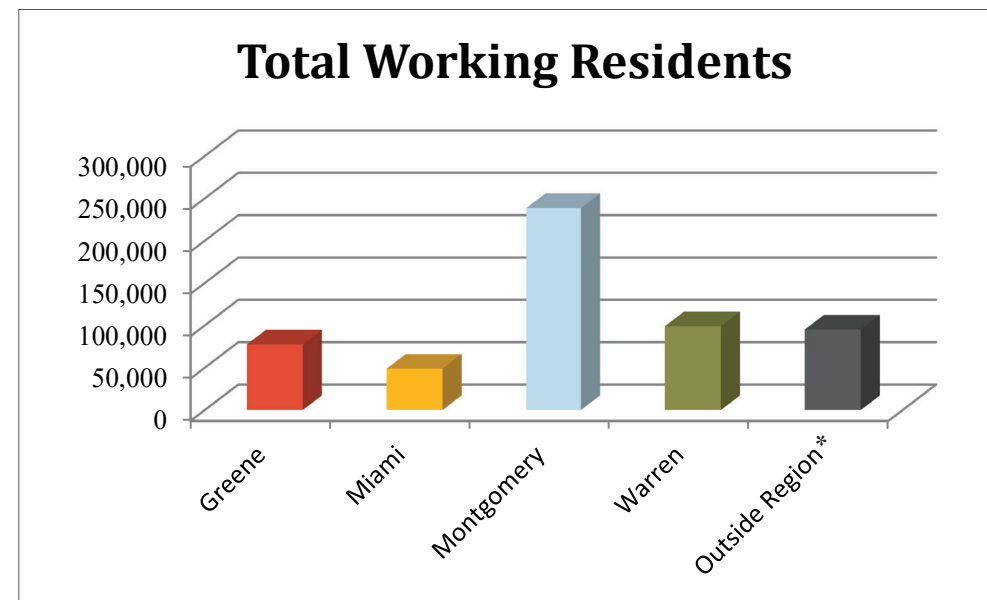
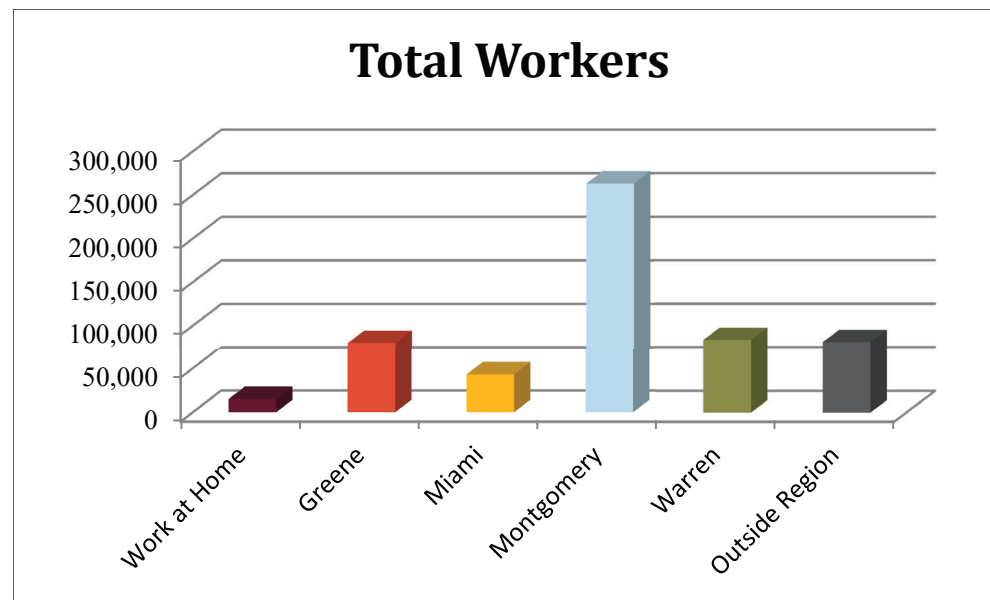
Average travel time to work was analyzed for the Region using the ACS data. The data revealed the average commute time in the Miami Valley Region to be 21.3 minutes. The average commute time was 20.8 minutes for Montgomery County workers, 19.5 minutes for Greene County workers, and 20.7 minutes for Miami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





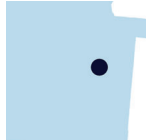





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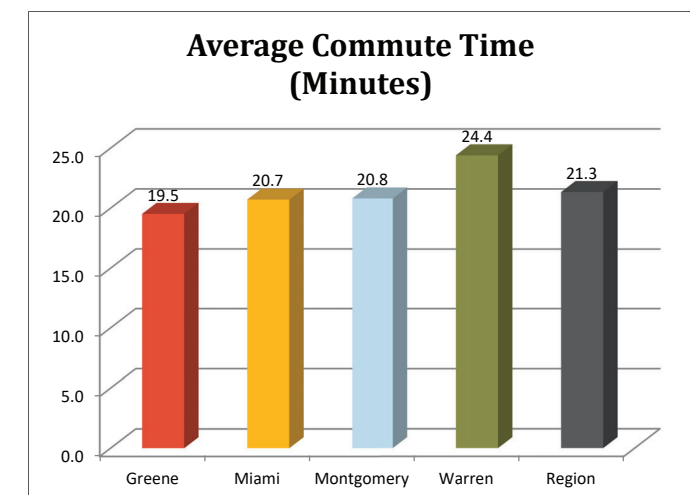
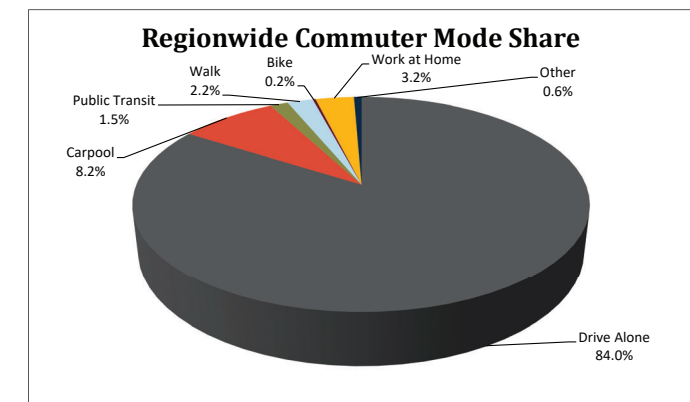
<sup>1</sup> Federal Highway Administration (FHWA), 1995 *National Personal Transportation Survey*.





**Figure 3.7**  
**Regionwide**  
**Journey-to-Work**  
**Characteristics**

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



Source: American Community Survey 2006-2010

May 2021

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



### 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).

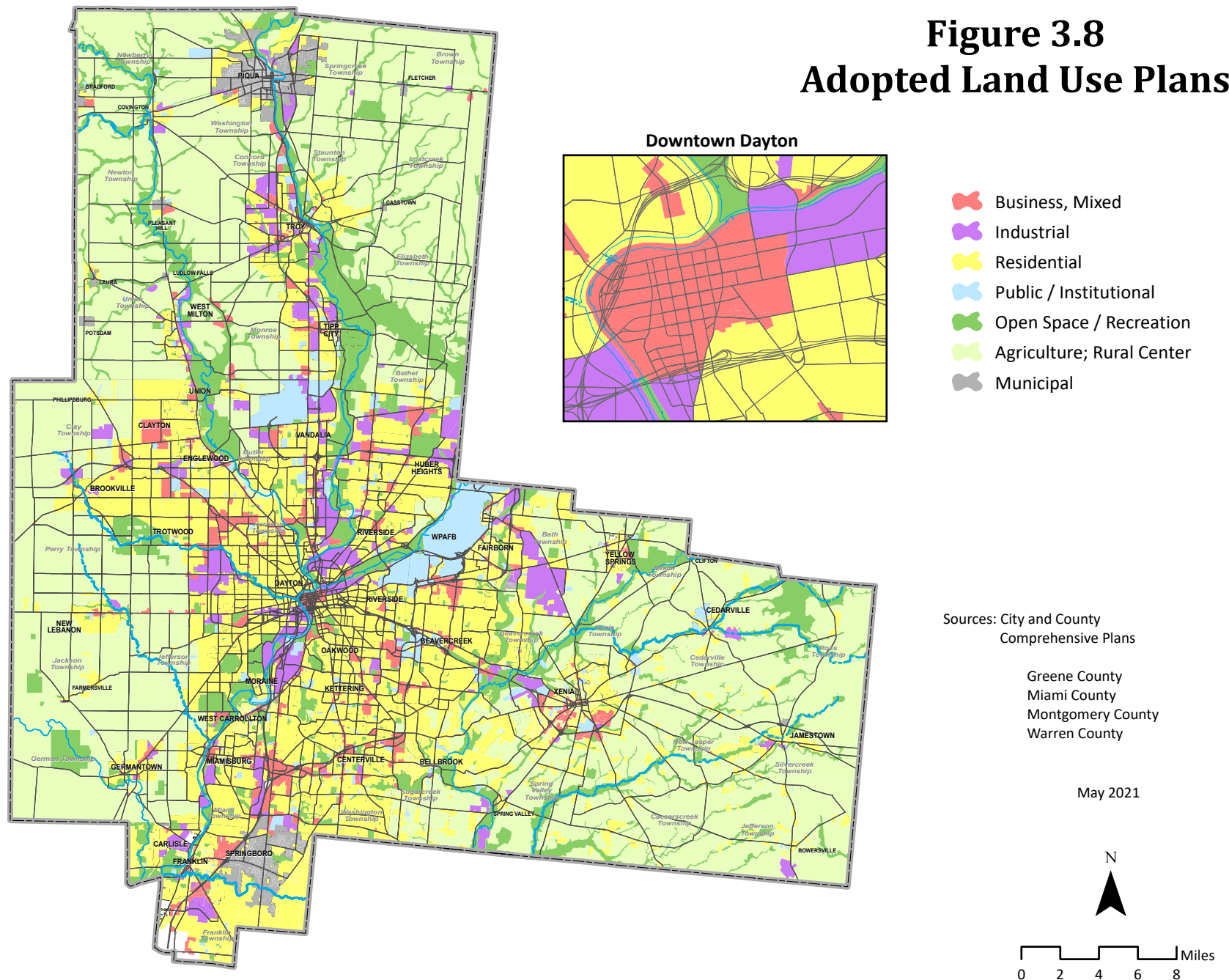
As illustrated in Figure 3.8, residential areas are to remain in the eastern part of Montgomery County, western part of Greene County, and along the I-75 corridor in Miami County. However, it is observed that additional residential developments are planned beyond what is currently developed throughout 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 external edge of the City of Xenia, and along SR 49 in western Montgomery County. Northern Warren County is also projected to experience new development.

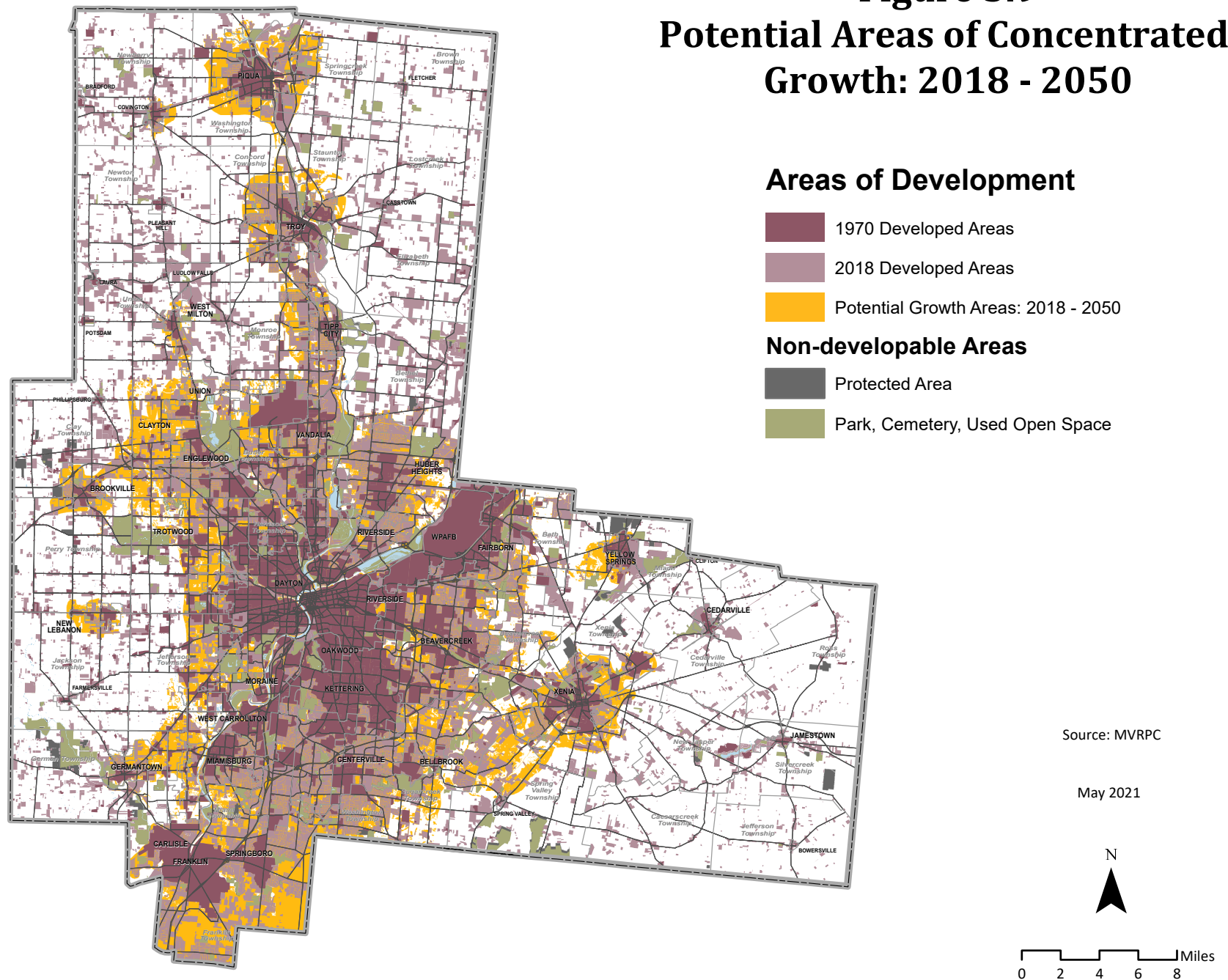
## Figure 3.8 Adopted Land Use Plans





## Figure 3.9

### Potential Areas of Concentrated Growth: 2018 - 2050



## 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%
<b>Total</b>	<b>799,232</b>	<b>797,989</b>	<b>-0.16%</b>

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
<b>CBD</b>	-	-	-	-	4.51	5.08	4.51	5.08
<b>Urban</b>	5.63	5.46	7.82	7.55	5.97	5.03	6.07	5.18
<b>Suburban</b>	1.66	1.95	1.18	1.40	2.05	1.95	1.80	1.86
<b>Rural</b>	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)
<b>Greene</b>	97,406 (21.9%)	131,034 (25.0%)	34.52%
<b>Miami</b>	49,607 (11.1%)	64,023 (12.2%)	29.06%
<b>Montgomery</b>	298,018 (67.0%)	328,273 (62.7%)	10.15%
<b>Total</b>	<b>445,031</b>	<b>523,330</b>	<b>17.59%</b>

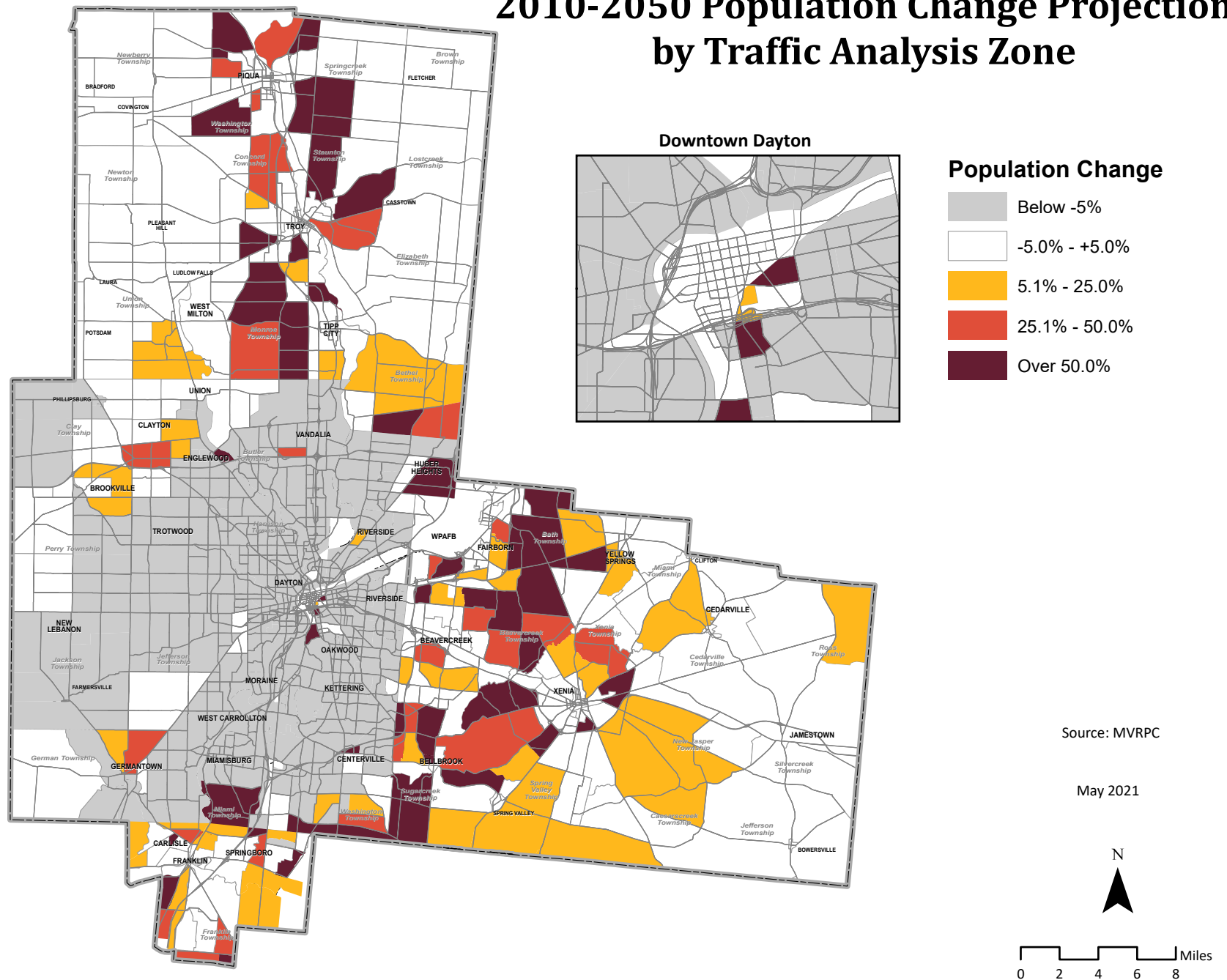
Source: MVRPC

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



**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
<b>CBD</b>	-	-	-	-	33.75	39.44	33.75	39.44
<b>Urban</b>	6.66	8.99	3.27	4.42	2.75	3.10	2.85	3.28
<b>Suburban</b>	1.07	1.45	0.77	1.01	1.11	1.20	1.05	1.24
<b>Rural</b>	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*

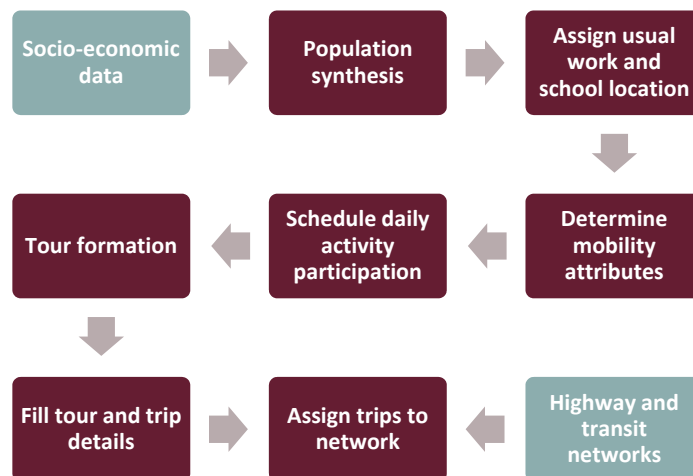
The OKI/MVRPC Travel Demand Forecasting Model (TDFM) includes the combined planning regions under the jurisdictions of the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) and MVRPC. The combined OKI/MVRPC TDFM was originally developed as part of the North-South Transportation Initiative in 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
<b># of TAZs</b>	64	209	456	125	854
<b>Acres</b>	873	30,770	301,234	492,832	825,709
<b>2010 Census Population</b>	3,938	186,871	542,603	65,820	799,232
<b>2010 Households</b>	2,151	77,534	223,534	24,411	327,630
<b>2010 Employment</b>	29,474	87,795	315,449	12,652	445,370
<b>2050 Population</b>	4,434	159,512	559,807	74,237	797,989
<b>2050 Households</b>	2,615	68,108	237,141	28,688	336,552
<b>2050 Employment</b>	34,434	100,925	373,715	14,256	523,330
<b>2010 Persons per Household</b>	1.30	2.31	2.37	2.58	2.37
<b>2010 Workers per Household</b>	0.51	0.99	1.12	1.32	1.10
<b>2010 Autos per Household</b>	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
<b>2010</b>	695,473	429,181	64,065	490,442	709,853	129,685	156,952	175,929
<b>2050</b>	739,046	471,259	65,993	520,437	753,998	163,293	169,606	274,740

Source: MVRPC