PUBLIC TRANSIT – HUMAN SERVICES
TRANSPORTATION COORDINATION PLAN
FOR GREENE, MIAMI, MONTGOMERY, AND
PORTIONS OF NORTHERN WARREN COUNTY,
OHIO

STUDY AREA AND FOCUS POPULATION ANALYSIS

March 7, 2008

prepared for the

Miami Valley Regional Planning Commission

by

WESTAT

in conjunction with
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXECUTIVE SUMMARY</td>
<td>S-1</td>
</tr>
<tr>
<td>Senior Population Trends</td>
<td>S-1</td>
</tr>
<tr>
<td>Population Trends for Persons with disabilities</td>
<td>S-2</td>
</tr>
<tr>
<td>Low Income Population Trends</td>
<td>S-2</td>
</tr>
<tr>
<td>Miami Valley Transportation Services</td>
<td>S-2</td>
</tr>
<tr>
<td>1 OVERALL POPULATION PROJECTIONS FOR THE REGION</td>
<td>1</td>
</tr>
<tr>
<td>2 SENIOR POPULATION TRENDS</td>
<td>7</td>
</tr>
<tr>
<td>3 POPULATION TRENDS FOR PERSONS WITH DISABILITIES</td>
<td>13</td>
</tr>
<tr>
<td>Overall Population</td>
<td>13</td>
</tr>
<tr>
<td>Seniors with Disabilities</td>
<td>18</td>
</tr>
<tr>
<td>4 LOW-INCOME POPULATION TRENDS</td>
<td>23</td>
</tr>
<tr>
<td>5 SPATIAL ANALYSIS OF TRANSPORTATION SERVICES IN THE MIAMI VALLEY REGION</td>
<td>29</td>
</tr>
<tr>
<td>The Regional Perspective</td>
<td>29</td>
</tr>
<tr>
<td>Montgomery County</td>
<td>31</td>
</tr>
<tr>
<td>Greene County</td>
<td>35</td>
</tr>
<tr>
<td>Miami County</td>
<td>35</td>
</tr>
<tr>
<td>6 MAJOR REGIONAL DESTINATIONS</td>
<td>39</td>
</tr>
<tr>
<td>Employment Centers</td>
<td>39</td>
</tr>
<tr>
<td>Health and Human Services</td>
<td>46</td>
</tr>
<tr>
<td>College and Technical Education</td>
<td>52</td>
</tr>
</tbody>
</table>

## APPENDICES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Population Forecasting Methodology</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (continued)

TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Miami Valley Population, 2000-2030</td>
</tr>
<tr>
<td>2-1</td>
<td>Senior Population, 2000 – 2030</td>
</tr>
<tr>
<td>3-1</td>
<td>Population with Disabilities, 2000 to 2030</td>
</tr>
<tr>
<td>3-2</td>
<td>Senior Disabled Population, 2000 to 2030</td>
</tr>
<tr>
<td>4-1</td>
<td>Change in the Low-Income Population, 2000 to 2030</td>
</tr>
<tr>
<td>6-1</td>
<td>Employment for All Employers</td>
</tr>
<tr>
<td>6-2</td>
<td>Entry-Level Employment</td>
</tr>
</tbody>
</table>

FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Percentage Change of the Total Population, 2000 to 2030</td>
</tr>
<tr>
<td>1-2</td>
<td>Total Population, Persons per Square Mile, 2000</td>
</tr>
<tr>
<td>1-3</td>
<td>Total Population, Persons per Square Mile, 2030</td>
</tr>
<tr>
<td>1-4</td>
<td>Percentage Change of the Total Population per Square Mile, 2000-2030</td>
</tr>
<tr>
<td>2-1</td>
<td>Change in the Proportion of Senior Adults, 2000 to 2030</td>
</tr>
<tr>
<td>2-2</td>
<td>Senior Population (Ages 65+) per Square Mile, 2000</td>
</tr>
<tr>
<td>2-3</td>
<td>Senior Population (Ages 65+) per Square Mile, 2030</td>
</tr>
<tr>
<td>2-4</td>
<td>Percentage Change of the Senior Adult Population per Square Mile, 2000-2030</td>
</tr>
<tr>
<td>3-1</td>
<td>Change in the Proportion of the Population with Disabilities, 2000 to 2030</td>
</tr>
<tr>
<td>3-2</td>
<td>Persons (Ages 5+) with Disabilities per Square Mile, 2000</td>
</tr>
<tr>
<td>3-3</td>
<td>Persons (Ages 5+) with Disabilities per Square Mile, 2030</td>
</tr>
<tr>
<td>3-4</td>
<td>Percentage Change of the Population (Ages 5+) with Disabilities per Square Mile, 2000 to 2030</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS (continued)

## FIGURES (continued)

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-5</td>
<td>Proportion of the Senior Adult Population with Disabilities, 2000 to 2030</td>
<td>18</td>
</tr>
<tr>
<td>3-6</td>
<td>Senior Adult Population (Ages 65+) with Disabilities per Square Mile, 2000</td>
<td>20</td>
</tr>
<tr>
<td>3-7</td>
<td>Senior Adult Population (Ages 65+) with Disabilities per Square Mile, 2030</td>
<td>21</td>
</tr>
<tr>
<td>3-8</td>
<td>Percentage Change of the Senior Adult Population (Ages 65+) with Disabilities per Square Mile, 2000 to 2030</td>
<td>22</td>
</tr>
<tr>
<td>4-1</td>
<td>Proportion of the Low-Income Population by Classification, 2000 and 2030</td>
<td>24</td>
</tr>
<tr>
<td>4-2</td>
<td>Persons below the Poverty Level per Square Mile, 2000</td>
<td>25</td>
</tr>
<tr>
<td>4-3</td>
<td>Persons below the Poverty Level per Square Mile, 2030</td>
<td>26</td>
</tr>
<tr>
<td>4-4</td>
<td>Percentage Change of the Population below the Poverty Level per Square Mile, 2000-2030</td>
<td>27</td>
</tr>
<tr>
<td>5-1</td>
<td>Public Transportation Routes</td>
<td>30</td>
</tr>
<tr>
<td>5-2</td>
<td>Senior EZ Ride Routes Compared to the Anticipated 2030 Senior Population</td>
<td>32</td>
</tr>
<tr>
<td>5-3</td>
<td>GDRTA Paratransit Service Area Compared to the Anticipated 2030 Population with Disabilities</td>
<td>33</td>
</tr>
<tr>
<td>5-4</td>
<td>Greene CATS Service Locations Compared to the Anticipated 2030 Total Population</td>
<td>34</td>
</tr>
<tr>
<td>5-5</td>
<td>Miami County Public Transit Service Locations Compared to the Anticipated 2030 Total Population</td>
<td>37</td>
</tr>
<tr>
<td>5-6</td>
<td>Miami County Public Transit Service Locations Compared to the Anticipated 2030 Population below the Poverty Level</td>
<td>38</td>
</tr>
<tr>
<td>6-1</td>
<td>Miami Valley’s Largest Employers</td>
<td>41</td>
</tr>
<tr>
<td>6-2</td>
<td>Miami Valley Employment Centers by Type</td>
<td>43</td>
</tr>
<tr>
<td>6-3</td>
<td>General Motors Employees by Zip Code of Residence, 2006</td>
<td>44</td>
</tr>
<tr>
<td>6-4</td>
<td>Delphi Employees by Zip Code of Residence, 2006</td>
<td>45</td>
</tr>
<tr>
<td>6-5</td>
<td>Health Care Establishments in Relation to GDRTA Routes</td>
<td>49</td>
</tr>
<tr>
<td>6-6</td>
<td>GDRTA Senior EZ Ride</td>
<td>50</td>
</tr>
<tr>
<td>6-7</td>
<td>Human Services Establishments in Relation to GDRTA Senior EZ Ride Routes</td>
<td>53</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

Since 1950, population growth in the Miami Valley Area has tended to be heaviest in an outward pattern from the central City of Dayton. Growth has been the greatest to the north, east and south along the major corridors of the region. According to the Ohio Department of Development, population will remain relatively stable in the Miami Valley Regional Planning Commission (MVRPC) region from 2000 to 2030, growing at an overall rate of 6.7%. Projected county population growth rates are uneven across counties due in large part to flat or declining population trends in the urban center and in the older urban and inner ring suburban communities. The projected percent change in the total population from 2000 to 2030 by county is as follows:

- Greene 7.4%
- Miami 9.2%
- Montgomery -6.3%
- Preble 7.2%
- Northern Warren 163.5%.

SENIOR POPULATION TRENDS

In 2000, one in eight Miami Valley residents (117,064) were 65 years of age or older. By the year 2030, one in five Miami Valley residents will be 65 years of age or older, while the percent change in the senior population for the region is expected to increase 54.8% from 2000 to 2030. The projected percent change in the senior population from 2000 to 2030 by county is as follows:

- Greene 74.5%
- Miami 56.9%
- Montgomery 37.2%
- Preble 63.0%
- Northern Warren 276.0%

Intra-county analysis shows an increase and continuing trend of higher concentrations of the senior population in northwestern Dayton and Trotwood and eastern Montgomery County, particularly in the Kettering/Centerville/Washington Township and Riverside areas. The senior population also shows marked increases in the Huber Heights area in northern Montgomery County, Fairborn in Greene County, the City of Franklin in Warren County, and central Miami County.
POPULATION TRENDS FOR PERSONS WITH DISABILITIES

In 2000, one in six Miami Valley residents reported at least one long-lasting physical, mental, or emotional condition making it difficult or impeding the individual’s ability to go outside the home or to work. The population with disabilities is expected to grow across all counties in the MVRPC region from 2000 to 2030 by 14.6%. By the year 2030, one in five Miami Valley residents will have one or more disabilities.

By 2030, persons with disabilities are projected to be dispersed beyond the boundaries of the City of Dayton to the northwest and southeast. A concentration of persons with disabilities is also expected in the cities of Kettering and Fairborn.

LOW INCOME POPULATION TRENDS

According to the 2000 census, approximately 86,000 people lived below poverty in the Miami Valley Region. Approximately two-thirds of the people below the poverty threshold were concentrated in the central county of the region — Montgomery County. The highest concentration of people living below poverty was in the older communities of the region, which include the Cities of Dayton, Trotwood, Huber Heights, Fairborn, Xenia, Troy and Piqua.

According to an estimation model developed by Wright State University, the population living at or below the poverty level will remain relatively level in the MVRPC region from 2000 to 2030, in most cases fluctuating less than 2.0%. The projected percent change in the low income population from 2000 to 2030 by county shows some questionable results because the estimation model is heavily reliant upon population growth or decline; for example, Preble County’s low income population is expected to decrease by 4.3%. Projections for the low income population should be reviewed with caution.

MIAMI VALLEY TRANSPORTATION SERVICES

In the Miami Valley Region, three public transit agencies provide regular transportation opportunities to the residents of their respective counties — Montgomery, Greene, and Miami. The two remaining counties (Preble and Northern Warren Counties) provide very limited transportation service to their residents.

Regular fixed route public transit services are available in Montgomery, with some routes offering over 100 trips per day into selected areas. The public transportation service in Montgomery County aligns well with the existing health and human services infrastructure. In terms of aligning with employment opportunities, especially for the displaced manufacturing worker, the transportation system will be challenged to connect workers with opportunities in the far north and north east of the Miami Valley region as well as in the southwest. Both Miami and Greene Counties also provide public transportation through demand-response systems. In Miami
County, drivers may make up to 49 average daily trips (ADT) to a single location and in Greene County it is not uncommon for a driver to exceed 100 ADT to a single location.

As the population ages through the year 2030, transportation services for seniors will need to expand to meet the needs of the growing senior population in all MVRPC counties. Regarding the population of persons with disabilities, projected growth patterns indicate that the population will continue to be densest within the paratransit service area of Project Mobility in Montgomery County, and will increase by 5.5% by 2030, requiring additional service. Since Project Mobility provides complementary paratransit services under the Americans with Disabilities Act, the program’s service delivery area would not expand unless public transit services provided by GDRTA also expand.

For the low income population, Montgomery County’s public transportation routes align with the densest populations. In Greene County, Xenia and Fairborn will continue to exhibit higher levels of poverty than other Greene County communities, thus requiring a higher level of service. With the growth of retail and service establishments along the western edge of the county, additional transportation may be worth consideration to connect job seekers with entry-level job opportunities in Beavercreek and Bellbrook.

In Miami County, Troy, Tipp City, Piqua, and West Milton are projected to exhibit higher levels of poverty in some Census Tracts, requiring a higher level of service. With the growth of retail and service establishments along I-75 in Miami County and the northern edge of Montgomery County, additional transportation may also be needed to connect residents to employment and services in that area.
OVERALL POPULATION PROJECTIONS FOR THE REGION

Since 1950, population growth in the Miami Valley Area has tended to be heaviest in an outward pattern from the central City of Dayton. Growth has been the greatest to the north, east, and south along the major corridors of the region. In the 1980s, development and population growth slowed in the east but continued to expand into the northwest and southern suburbs of the City of Dayton. In the decade between 1990 and 2000, development and population growth increased in the eastern communities and continued to grow in the northern and southern communities of the region within and beyond Montgomery County.

According to the Ohio Department of Development, population will remain relatively level in the Miami Valley Regional Planning Commission (MVRPC) region from 2000 to 2030. County population growth rates are uneven across counties due in large part to flat or declining development trends in the urban center and in the older urban and inner ring suburban localities. In northern Warren County, on the other hand, the growth of the population is expected to increase rapidly in the decade between 2000 and 2010 and then taper off to approximately 24% each decade to 2020 and 2030 (Table 1). Conversely, in Montgomery County, population declined from 1990 to 2000 (-2.6%), and is projected to be flat from 2020 to 2030 (-0.9%). In Greene, Miami, and Preble counties, the percentage change in population decreases over time. (See Appendix A for details concerning population projection methods used.)

Table 1-1:
MIAMI VALLEY POPULATION, 2000-2030

<table>
<thead>
<tr>
<th>County</th>
<th>Pop. 2000</th>
<th>Percent Change</th>
<th>Pop. 2010</th>
<th>Percent Change</th>
<th>Pop. 2020</th>
<th>Percent Change</th>
<th>Pop. 2030</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miami Valley Region</td>
<td>892,059</td>
<td>1.2%</td>
<td>914,901</td>
<td>2.6%</td>
<td>932,676</td>
<td>1.9%</td>
<td>951,932</td>
<td>2.1%</td>
</tr>
<tr>
<td>Greene County</td>
<td>147,886</td>
<td>8.2%</td>
<td>151,759</td>
<td>2.6%</td>
<td>156,590</td>
<td>3.2%</td>
<td>158,857</td>
<td>1.4%</td>
</tr>
<tr>
<td>Miami County</td>
<td>98,868</td>
<td>6.1%</td>
<td>103,459</td>
<td>4.6%</td>
<td>106,771</td>
<td>3.2%</td>
<td>107,929</td>
<td>1.1%</td>
</tr>
<tr>
<td>Montgomery County</td>
<td>559,062</td>
<td>-2.6%</td>
<td>540,425</td>
<td>-3.3%</td>
<td>528,802</td>
<td>-2.2%</td>
<td>524,062</td>
<td>-0.9%</td>
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<tr>
<td>Preble County</td>
<td>42,337</td>
<td>5.5%</td>
<td>44,201</td>
<td>4.4%</td>
<td>45,070</td>
<td>2.0%</td>
<td>45,379</td>
<td>0.7%</td>
</tr>
<tr>
<td>N. Warren County</td>
<td>43,906</td>
<td>17.2%</td>
<td>75,057</td>
<td>70.9%</td>
<td>95,443</td>
<td>27.2%</td>
<td>115,705</td>
<td>21.2%</td>
</tr>
</tbody>
</table>

Source: Ohio Department of Development, Office of Strategic Research

1 Key authors of this report were Jane Dockery and Carol Hooker of Wright State University. Jon Burkhardt of Westat edited this report and supervised its production.

2 Population Projections issued by: Ohio Department of Development, Office of Strategic Research, P.O. Box 1001, Columbus, OH 43216-1001, March, 2003
Figure 1-1 presents the percent change in total population for the region and by county (just the northern portion of Warren County is presented due to its participation in the MVRPC). The figure shows the unique growth trend in Northern Warren County in comparison to the more stable patterns in the rest of the region.

![Figure 1-1: Percentage Change of the Total Population, 2000 to 2030](image)

Source: Ohio Department of Development, Office of Strategic Research

Figures 1-2, 1-3, and 1-4 present total population density (persons per square mile) for the year 2000, the year 2030, and the change in density from 2000 to 2030. Figure 1-2 shows year 2000 data and demonstrates that the most densely populated areas are in the eastern and western portions of the City of Dayton and in the City of Huber Heights, with various census tracts showing strong concentration. The most notable changes in the year 2030 occur in selected census tracts in the City of Huber Heights, Fairborn, and Yellow Springs, which are projected to become less densely populated, and in Northern Warren County, which will become more densely populated (Figure 1-3). Figure 1-4, shows the change in density from 2000 to 2030. While the overall picture is one of small population decline in the region’s most urban and rural counties, stable population growth in its more suburban counties, and strong growth in Northern Warren County, some Census tracts in both the northern and southern portions in Montgomery County will experience small to modest growth where development continues to occur. In Preble County, no change or a small amount of growth is expected primarily in the southwestern portion of the county. Stable population growth is projected for the suburban counties of Greene and Miami, with some localized small to modest growth in Greene County and general small to modest growth in Miami County. Strong growth is expected in Northern Warren County.
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: Total Population, Persons per Square Mile, 2000

Figure 1-2: Total Population, Persons per Square Mile, 2000
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: Total Population, Persons per Square Mile, 2030

Figure 1-3: Total Population, Persons per Square Mile, 2030

Sources:
U.S. Census Bureau, Census 2000, Summary File 3.
Miami Valley Regional Planning, Traffic Analysis Zone Population and Employment Projections
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: Percentage Change of the Total Population per Square Mile, 2000-2030

Figure 1-4: Percentage Change of the Total Population per Square Mile, 2000-2030

Sources:
U.S. Census Bureau, Census 2000, Summary File 3;
Ohio Department of Development, Office of Strategic Research, Population Projections for Ohio and Counties by Age and Sex: 2000 to 2030, March 2004;
Miami Valley Regional Planning, Traffic Analysis Zone Population and Employment Projections;
2

SENIOR POPULATION TRENDS

In 2000, one in eight Miami Valley residents (117,064) were 65 years of age or older. This population, the senior population, is expected to grow across all counties in the MVRPC region from 2000 to 2030 by 17.1% as a result of the aging population and the phenomenon of aging in place. By the year 2030, one in five Miami Valley residents will be 65 years of age or older (Figure 2-1).

Senior population growth rates are uneven across counties due to vastly disparate total population growth trends. In Greene County, for example, the senior population is expected to grow on average 25% each decade to 2030 (Table 2-1), with a projected increase of 75% from 2000 to 2030. Miami County’s growth in senior population over this time period is projected to be 57%. In Montgomery County, senior population growth trends were flat from 1990 to 2000 (6.6%), and are projected to be flat from 2000 to 2010 (1%) with relatively modest increases thereafter (19% and 15% increases in 2020 and 2030, respectively), leading to an overall increase of 37% from 2000 to 2030. Northern Warren County, with the smallest senior population in 2000, is projected to see the largest proportional increase from 2000 to 2030 (a growth of 276%).

Figure 2-1: Change in the Proportion of Senior Adults, 2000 to 2030
Source: Ohio Department of Development, Office of Strategic Research
Table 2-1:
SENIOR POPULATION, 2000 - 2030

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<th></th>
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</thead>
<tbody>
<tr>
<td>Miami Valley Region</td>
<td>117,064</td>
<td>125,633</td>
<td>7.3%</td>
<td>154,759</td>
<td>181,240</td>
<td>17.1%</td>
<td>54.8%</td>
</tr>
<tr>
<td>Greene County</td>
<td>17,361</td>
<td>20,159</td>
<td>16.1%</td>
<td>26,560</td>
<td>30,293</td>
<td>14.1%</td>
<td>74.5%</td>
</tr>
<tr>
<td>Miami County</td>
<td>13,101</td>
<td>14,649</td>
<td>11.8%</td>
<td>17,832</td>
<td>20,551</td>
<td>15.2%</td>
<td>56.9%</td>
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<tr>
<td>Montgomery County</td>
<td>76,786</td>
<td>77,340</td>
<td>0.7%</td>
<td>91,907</td>
<td>105,346</td>
<td>14.6%</td>
<td>37.2%</td>
</tr>
<tr>
<td>Preble County</td>
<td>5,566</td>
<td>6,010</td>
<td>8.0%</td>
<td>7,509</td>
<td>9,071</td>
<td>20.8%</td>
<td>63.0%</td>
</tr>
<tr>
<td>N. Warren County</td>
<td>4,250</td>
<td>7,475</td>
<td>75.9%</td>
<td>10,951</td>
<td>15,979</td>
<td>45.9%</td>
<td>276.0%</td>
</tr>
</tbody>
</table>

Source: Ohio Department of Development, Office of Strategic Research

Comparing the maps for the year 2000 and 2030 in Figures 2-2 and 2-3, the data show an increase and continuing trend of higher concentration of the senior population in northwestern Dayton and Trotwood and eastern Montgomery County, particularly in the Kettering/Centerville/Washington Township and Riverside areas. The senior population also shows marked increases in the Huber Heights area in northern Montgomery County, Fairborn in Greene County, the City of Franklin in Warren County, and central Miami County.

Figure 2-4 presents a composite of the two previous maps, showing the percentage change in the senior population from 2000 to 2030 by census tract. Most communities will experience no change or a slight gain in the percentage of the senior population. The pattern is basically one which shows greater change in the urban areas. The next greatest change is in the first ring surrounding urban areas, and then no or slight change beyond that first ring. The greatest increases in the senior population are projected to be in west Dayton proximate to the downtown; one census tract in Kettering, Riverside, and Fairborn; and several census tracts in Franklin.
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: 
Seniors (Ages 65+) per Square Mile, 2000

Figure 2-2: Senior Population (Ages 65+) per Square Mile, 2000
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: Seniors (Ages 65+) per Square Mile, 2030

Figure 2-3: Senior Population (Ages 65+) per Square Mile, 2030
3

POPULATION TRENDS FOR PERSONS WITH DISABILITIES

OVERALL POPULATION

In 2000, one in six Miami Valley residents reported at least one long-lasting physical, mental, or emotional condition making it difficult or impeding the individual’s ability to go outside the home or to work. The population with disabilities is expected to grow across all counties in the MVRPC region from 2000 to 2030 by 14.6%. This estimate is impacted by the growth in the senior population as well as the change in the definition of disability that occurred in the 2000 Census (see note below). By the year 2030, one in five Miami Valley residents will have one or more disabilities (Figure 3-1).

Figure 3-1: Change in the Proportion of the Population with Disabilities, 2000 to 2030
Source: Wright State University Estimation Model based on data from the Census Bureau and the Ohio Department of Development, Office of Strategic Research

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3 2000 Census Definition of Disability: During the past 30 years, the accepted definitions of disability have changed. The 1990 Census and Census 2000 disability items are not comparable. The 1990 census data products did not include a general disability status indicator, while the year 2000 Census did, resulting in higher reported percentages of the disabled population in 2000. Because the estimation model is, in part, reliant upon historic changes to project future trends, the model may be producing results larger than would otherwise be the case.
Growth rates among the population with disabilities are uneven across counties due to vastly disparate total population growth trends (Table 3-1). In Greene County, the growth of the disabled population will average 9% across each decade. Conversely, Montgomery County’s proportion of the population with disabilities will remain relatively flat due to downward total population and senior population trends. Warren County is the anomaly, where its tremendous population growth trends affect projections for the number of disabled.

**Table 3-1:**
**POPULATION WITH DISABILITIES, 2000 TO 2030**

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</thead>
<tbody>
<tr>
<td>Miami Valley Region</td>
<td>149,458</td>
<td>159,337</td>
<td>6.6%</td>
<td>170,380</td>
<td>6.9%</td>
<td>181,096</td>
<td>6.3%</td>
<td>21.2%</td>
</tr>
<tr>
<td>Greene County</td>
<td>20,258</td>
<td>22,068</td>
<td>8.9%</td>
<td>24,537</td>
<td>11.2%</td>
<td>25,992</td>
<td>5.9%</td>
<td>28.3%</td>
</tr>
<tr>
<td>Miami County</td>
<td>14,947</td>
<td>19,828</td>
<td>32.7%</td>
<td>22,166</td>
<td>11.8%</td>
<td>24,078</td>
<td>8.6%</td>
<td>61.1%</td>
</tr>
<tr>
<td>Montgomery County</td>
<td>100,332</td>
<td>100,305</td>
<td>0.0%</td>
<td>102,735</td>
<td>2.4%</td>
<td>105,881</td>
<td>3.1%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Preble County</td>
<td>7,350</td>
<td>7,866</td>
<td>7.0%</td>
<td>8,687</td>
<td>10.4%</td>
<td>9,506</td>
<td>9.4%</td>
<td>29.3%</td>
</tr>
<tr>
<td>N. Warren County</td>
<td>6,571</td>
<td>9,270</td>
<td>41.1%</td>
<td>12,255</td>
<td>32.2%</td>
<td>15,639</td>
<td>27.6%</td>
<td>138.0%</td>
</tr>
</tbody>
</table>

Source: Wright State University Estimation Model based on data from the Census Bureau and the Ohio Department of Development, Office of Strategic Research

Figures 3-2 and 3-3 present the spatial distribution of the population with disabilities in the year 2000 and 2030, respectively. Comparing the maps shows a dispersion of the disabled population beyond the City of Dayton boundaries to the northwest and southeast. A strong concentration of the disabled population is also evident in Kettering and Fairborn.

Figure 3-4 shows that generally there will be no or little change in the prevalence of the disabled population from 2000 to 2030. However, Kettering, Beavercreek, and most cities in Miami County are showing small to modest gains in the disabled population. Moderate to high gains are found in a few census tracts distributed in Greene and Montgomery counties, along with several census tracts in Northern Warren County.
Greene, Miami, Montgomery, Preble, and Northern Warren Counties:
Population (Ages 5+) with Disabilities per Square Mile, 2000

Figure 3-2: Persons (Ages 5+) with Disabilities per Square Mile, 2000

Sources:
U.S. Census Bureau, Census 2000, Summary File 3;
Ohio Department of Development, Office of Strategic Research, Population
Figure 3-3: Persons (Ages 5+) with Disabilities per Square Mile, 2030
Greene, Miami, Montgomery, Preble, and Northern Warren Counties:
Percentage Change of the Population (Ages 5+) with Disabilities per Square Mile, 2000-2030
SENIORS WITH DISABILITIES

In 2000, 39% of Miami Valley senior residents reported one or more disabilities. The senior disabled population is expected to grow across all counties in the MVRPC region from 2000 to 2030 by 17.5%. By the year 2030, the senior disabled population is projected to increase to 44% of the senior population (Figure 3-5).

Figure 3-5: Proportion of the Senior Adult Population with Disabilities, 2000 to 2030
Source: Wright State University Estimation Model based on data from the Census Bureau and the Ohio Department of Development, Office of Strategic Research

Table 3-2 reveals that growth rates among the senior population with disabilities are projected to be uneven. For example, in Miami County the senior disabled population is projected to increase 96% in the decade between 2000 and 2010 and decline each decade thereafter. In Greene County, the proportion of the senior population with disabilities will increase through 2020 tapering off to 15% in 2030. Conversely, the senior population with disabilities in Montgomery County will remain relatively steady through 2010 and increase more than 19% in the decade between 2010 and 2020, and 15% from 2020 to 2030.
Table 3-2:
SENIOR DISABLED POPULATION, 2000 TO 2030

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Miami Valley Region</td>
<td>45,550</td>
<td>54,925</td>
<td>20.6%</td>
<td>67,923</td>
<td>79,836</td>
<td>17.5%</td>
<td>75.3%</td>
</tr>
<tr>
<td>Greene County</td>
<td>6,352</td>
<td>7,912</td>
<td>24.6%</td>
<td>10,509</td>
<td>12,090</td>
<td>15.0%</td>
<td>90.3%</td>
</tr>
<tr>
<td>Miami County</td>
<td>4,771</td>
<td>9,364</td>
<td>96.3%</td>
<td>11,628</td>
<td>13,672</td>
<td>17.6%</td>
<td>186.6%</td>
</tr>
<tr>
<td>Montgomery County</td>
<td>30,437</td>
<td>32,519</td>
<td>6.8%</td>
<td>38,712</td>
<td>44,468</td>
<td>14.9%</td>
<td>46.1%</td>
</tr>
<tr>
<td>Preble County</td>
<td>2,395</td>
<td>2,817</td>
<td>17.6%</td>
<td>3,656</td>
<td>4,579</td>
<td>25.2%</td>
<td>91.2%</td>
</tr>
<tr>
<td>N. Warren County</td>
<td>1,595</td>
<td>2,313</td>
<td>45.0%</td>
<td>3,418</td>
<td>5,027</td>
<td>47.1%</td>
<td>215.2%</td>
</tr>
</tbody>
</table>

Source: Wright State University Estimation Model based on data from the Census Bureau and the Ohio Department of Development, Office of Strategic Research

Comparing the maps for the year 2000 to 2030 for the populations of seniors with disabilities shows densest concentrations will continue to exist in northwest Dayton and Trotwood (Figures 3-6 and 3-7). Kettering and Riverside in Montgomery County, Fairborn in Greene County, and the cities of Franklin and Springboro in Warren County will witness higher concentrations of disabled over time as well. Figure 3-8 presents the projected percentage change in the senior disabled population from 2000 to 2030, presents a large geography exhibiting moderate to high gains, with very high gains in selected census tracts in West and East Dayton, Kettering, Fairborn, and the City of Franklin.
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: Seniors (Ages 65+) with Disabilities per Square Mile, 2000

Figure 3-6: Senior Adult Population (Ages 65+) with Disabilities per Square Mile, 2000

Sources:
U.S. Census Bureau, Census 2000, Summary File 3;
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: Seniors (Ages 65+) with Disabilities per Square Mile, 2030

Figure 3-7: Senior Adult Population (Ages 65+) with Disabilities per Square Mile, 2030

Sources:
U.S. Census Bureau, Census 2000, Summary File 3;
Greene, Miami, Montgomery, Preble, and Northern Warren Counties:
Percentage Change of the Senior Population (Ages 65+) with Disabilities per Square Mile, 2000-2030

Figure 3-8: Percentage Change of the Senior Adult Population (Ages 65+) with Disabilities per Square Mile, 2000 to 2030

Sources:
U.S. Census Bureau, Census 2000, Summary File 3;
LOW-INCOME POPULATION TRENDS

In 2000, 193,685 Miami Valley residents met guidelines to qualify for many Federal Low-Income Assistance Programs (i.e., food and nutrition assistance programs, home energy assistance programs, and low-income Medicaid coverage, etc.). Income eligibility to qualify for these program benefits or entitlements is based around the 185% poverty rate. Using this metric, nearly 22% of Miami Valley Residents are considered to be low-income (below 185% of the poverty rate) and this rate will remain constant through 2030.

For the purposes of this study, low-income population was identified as people living below the level of poverty at the 2000 Census. According to the 2000 census, approximately 85,000 people lived below poverty in the Miami Valley Region. Approximately two-thirds of the people below the poverty threshold were concentrated in the central county of the region — Montgomery. The highest concentration of people living below poverty was in the older communities of the region, which include the Cities of Dayton, Trotwood, Huber Heights, Fairborn, Xenia, Troy and Piqua.

According to an estimation model developed by Wright State University, the population living at or below the poverty level will remain relatively level in the MVRPC region from 2000 to 2030, in most cases fluctuating less than 2.0%. These estimates are based on the assumption that poverty rates will remain constant and therefore mirror the change in population. In Greene County, the growth of the population living below the poverty level is expected to increase approximately 6% by 2010 and 3% by 2020. The population living below the poverty level in Miami and Montgomery Counties is projected to remain relatively level, but still decrease slightly over the thirty year horizon. Warren County is again the anomaly, where its tremendous population growth affects the calculations of the projected population living below the poverty level as well. The researchers do not accept the results of the projections model in this case. It is expected that most of the growth in northern Warren County will result from rapid development and the poverty rate will not increase as rapidly as the projections indicate here.

In Figure 4-1, an analysis of just those living below the poverty level shows that nearly half (40,000) also lived in severe or deep poverty (at or below 50% of the poverty level). The population in severe poverty is expected to remain relatively level, increasing 1.7% by the year 2030 to nearly 41,000 Miami Valley residents. In Greene and Miami Counties the population living in deep poverty is expected to increase by 11% and 7% respectively for this same period. However, the population living in severe poverty will remain constant for Montgomery and Preble counties (decreasing approximately 4%).
Table 4-1:
CHANGE IN THE LOW-INCOME POPULATION, 2000 TO 2030

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Miami Valley Region</td>
<td>84,784</td>
<td>85,870</td>
<td>1.3%</td>
<td>86,059</td>
<td>0.2%</td>
<td>86,606</td>
<td>0.6%</td>
</tr>
<tr>
<td>Greene County</td>
<td>11,847</td>
<td>12,560</td>
<td>6.0%</td>
<td>12,951</td>
<td>3.1%</td>
<td>13,138</td>
<td>1.4%</td>
</tr>
<tr>
<td>Miami County</td>
<td>6,531</td>
<td>6,707</td>
<td>2.7%</td>
<td>6,907</td>
<td>3.0%</td>
<td>6,968</td>
<td>0.9%</td>
</tr>
<tr>
<td>Montgomery County</td>
<td>61,440</td>
<td>60,816</td>
<td>-1.0%</td>
<td>59,475</td>
<td>-2.2%</td>
<td>58,924</td>
<td>-0.9%</td>
</tr>
<tr>
<td>Preble County</td>
<td>2,552</td>
<td>2,491</td>
<td>-2.4%</td>
<td>2,514</td>
<td>0.9%</td>
<td>2,442</td>
<td>-2.9%</td>
</tr>
<tr>
<td>N. Warren County</td>
<td>2,414</td>
<td>3,296</td>
<td>36.5%</td>
<td>4,212</td>
<td>27.8%</td>
<td>5,134</td>
<td>21.9%</td>
</tr>
</tbody>
</table>

Source: Wright State University Estimation Model based on data from the Census Bureau and the Ohio Department of Development, Office of Strategic Research

Figure 4-1: Proportion of the Low-Income Population by Classification, 2000 and 2030
Source: Wright State University Estimation Model based on data from the Census Bureau and the Ohio Department of Development, Office of Strategic Research

Comparing the population from the 2000 maps to the 2030 maps (Figures 4-2 through 4-4), the data demonstrate a continuing trend of a higher concentration of poverty in the cities, but particularly in the cities of Dayton and West Carrollton in Montgomery County, Franklin in Warren County, and Fairborn in Greene County.
Greene, Miami, Montgomery, Preble, and Northern Warren Counties:
Persons below the Poverty Level per Square Mile, 2000

Figure 4-2: Persons below the Poverty Level per Square Mile, 2000

Sources:
U.S. Census Bureau, Census 2000, Summary File 3;
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: Persons below the Poverty Level per Square Mile, 2030

Figure 1-3: Persons below the Poverty Level per Square Mile, 2030

Sources:
U.S. Census Bureau. Census 2000, Summary File 3:
Greene, Miami, Montgomery, Preble, and Northern Warren Counties:
Percentage Change of the Population below the Poverty Level per Square Mile, 2000-2030

Figure 4-4: Percentage Change of the Population below the Poverty Level per Square Mile, 2000-2030
THE REGIONAL PERSPECTIVE

In the Miami Valley Region, three county public transit agencies provide regular transportation opportunities to their residents. Service delivery in these counties — Montgomery, Greene, and Miami will be discussed in greater detail. The two remaining counties (Preble and Northern Warren Counties) provide very limited transportation service to their residents. Access to employment, grocery, shopping, and medical services will need to be addressed both now and in the future for the general and special populations.

Regular service routes are available in Montgomery, in some cases making over 100 trips per day into selected areas (Figure 5-1). Both Miami and Greene Counties also provide public transportation through demand-response systems. In Miami County, drivers may make up to 49 average daily trips\(^4\) to a single location (see Figure 5-4) and in Greene it is not uncommon for a driver to exceed 100 trips to a single location in a day (see Figure 5-6).

\(^4\) Calculated by dividing the total number of trips to a single location from January 1, 2007 to June 30, 2007 and dividing that total by the 180 days of service possible for that period.
Greene, and Montgomery Counties:
2007 Public Transportation Routes, Monday through Friday Service, Projected 2030 Total Population

Figure 5-1: Public Transportation Routes

Public Transportation Routes
GDRTA Routes by frequency of trips
- 1-9 trips daily
- 10-19 trips daily
- 20-49 trips daily
- 50-99 trips daily
- 100+ trips daily
Total Population Expressed as Persons per Sq.Mi.
- 0 - 500
- 500 - 1,700
- 1,700 - 4,000
- 4,000 - 9,209

Source:
U.S. Census Bureau 2000, Summary File 3
Ohio Department of Development, Office of Strategic Research, Population Projections for Ohio Counties by Age and Sex: 2000 to 2030, March 2004
Greater Dayton Regional Transit Authority
MONTGOMERY COUNTY

The Regional Transportation Authority

Within the core urban area of Montgomery County, the population is served by regular fixed route public transit provided by the Greater Dayton Regional Transportation Authority (GDRTA). Regular routes serve the most densely populated areas in Montgomery County, as well as the areas with the most dense low-income populations. Limited trips are made to the smaller villages or incorporated jurisdictions: no regular routes are provided to the rural population. The rural residents of Montgomery County have very limited, if any, transit options, whether they be members of the general population or of elderly, disabled, and low-income populations.

Senior EZ Ride

Trips on the Senior EZ Ride service are available in the North Dayton/Trotwood area and the East Dayton/Kettering area (Figure 5-2). These EZ Ride routes provide necessary transportation links to many of the destinations seniors prefer, including senior citizens centers, grocery stores, shopping centers, medical care providers, and pharmacies. Senior EZ Ride Routes run Tuesdays and Thursdays serving the Northwest Dayton and Trotwood area and Mondays and Wednesdays serving the Southeast Dayton and Kettering area of Montgomery County.

As the population ages through the year 2030, service delivery for seniors will need to expand to meet the needs of the growing population. Anticipated growth patterns (up 37% from 2000 to 2030) indicate that expanded service will be necessary to connect seniors to services for the Northwest Route to serve Western Dayton and to the Southeast Dayton route to the communities of Riverside, Oakwood, Centerville, Miamisburg, and Washington Township and throughout the Kettering area. In addition to these expansions, new routes may need to be added to the Northern portion of Montgomery County to serve the cities of Huber Heights, Vandalia, Brookville, and Englewood.

Project Mobility

Project Mobility provides ADA complementary paratransit service to Montgomery County residents with certified disabilities who are unable to use regular fixed routes. According to the most recent ODOT report, Project Mobility provided approximately 300,000 trips in 2006 operating 78 vehicles. In order to use the service, individuals must be certified as ADA paratransit-eligible by the Project Mobility Certification Center, meaning that they are unable to travel to a regular bus stop or independently board, ride or exit an RTA fixed route bus, due to a

---

5 Information from the Greater Dayton Transit Authority.
Greene, and Montgomery Counties: Greater Dayton RTA Routes, Senior EZ Ride Service, 2007 Compared to the Senior Population, 2030

Figure 5-2: Senior EZ Ride Routes Compared to the Anticipated 2030 Senior Population
Greene and Montgomery Counties:
2007 GDRTA Paratransit Service Area and Anticipated Growth of Population with Disabilities

Figure 5-3: GDRTA Paratransit Service Area Compared to the Anticipated 2030 Population with Disabilities

Source:
U.S. Census Bureau 2000, Summary File 3
Ohio Department of Development, Office of Strategic Research, Population Projections for Ohio Counties by Age and Sex: 2000 to 2030, March 2004
Greater Dayton Regional Transit Authority
Greene CATS Service Locations Compared to the Total Population, Persons per Square Mile, 2030

Figure 5-4: Greene CATS Service Locations and Flex Route Compared to the Anticipated 2030 Total Population
disability. There are no restrictions on trip purpose, but all trips must take place within a ¾ mile corridor on each side of a fixed route (Figure 5-3). The hours of service will match the hours of service on the adjacent bus routes. Trips must be requested no later than the day before the trip. The fare is $2.00 per one-way trip.

Growth patterns indicate that the population with disabilities will continue to be densest within the paratransit service area, and will increase by 5.5% by 2030. It is likely that this projected increase in the number of persons with disabilities will require additional service from Project Mobility, but not an expanded service delivery area.

GREENE COUNTY

Greene County’s public transportation needs are met through the Greene CATS Public Transit System. The system is a demand-response system and is open to the general Greene County public to and from any destination in Greene County with limited service into Clark and Montgomery Counties. Reservations must be made no less than one business day in advance to request regular curb-to-curb or disability door-to-door service assistance. Service hours are from 6 a.m. – 6 p.m. seven days per week, except Thanksgiving, Christmas, and New Years. A Flex Service Route is also available in Xenia and Fairborn, the two areas with the highest concentration of low income populations, and runs from Xenia to Fairborn and Fairborn to Xenia (there are no stops between the cities) every 90 minutes, Monday through Friday, 6 a.m. to 6p.m. Current service locations are shown in Figure 5-4.

Looking to the future, the Greene County population is expected to grow 7.4% from 2000 to 2030 creating an increasing need for public transportation. Xenia and Fairborn will continue to exhibit higher levels of poverty than other Greene County communities, thus requiring a higher level of service. With the growth of retail and service establishments along the western edge of the county, another limited service flex route may be worth consideration to connect low-income individuals with entry-level job opportunities in Beavercreek and Bellbrook. The population in Greene County will also be aging in place and needing accessible and convenient modes of transportation to and from senior centers, necessities, shopping, and medical services. In addition to these needs, additional service may also be needed to connect residents to employment options that remain open after the current 6 p.m. termination of Greene CATS services.

MIAMI COUNTY

The Miami County Transit System provides demand-response service for the entire county. Transportation is provided for all Miami County residents, including, low-income, elderly and disabled individuals anywhere in Miami County with limited connections to the Montgomery County system in Vandalia and Huber Heights. Reservations must be made 7 days
in advance. Service hours are from 5 a.m. – 11 p.m. Monday through Friday 6 a.m. to 7 p.m. on Saturdays, and 8 a.m. to 2 p.m. Sundays.\(^6\) See Figure 5-5.

Although the service does cover the entire county, there may be a need for expanded service hours to connect individuals with entry-level occupations, such as service or retail occupations, which remain open after service termination and to accommodate the growing senior population.

Looking to the future, the Miami County population is expected to grow 9.2% and will witness a dramatic increase in the number of seniors (56.9%) from 2000 to 2030. Much of this growth will come from the aging in place of current Miami County residents. These factors will fuel an increasing demand for public transportation and possibly the need for fixed route services to connect seniors to government and personal services, shopping, and medical services. Figure 5-6 presents average daily ridership in 2007 in comparison to the projected senior population in 2030 to elucidate the discussion about where future service may be needed. Also in the future, Troy, Tipp City, Piqua, and West Milton are projected to exhibit higher levels of poverty in some Census Tracts, requiring a higher level of service. With the growth of retail and service establishments along I-75 in Miami County and the northern edge of Montgomery County, a limited service flex route may also be needed to connect residents to employment and services in that area. Figure 5-7 presents average daily ridership in 2007 in comparison to the projected low income population in 2030 to provide insights regarding future service needs.

\(^6\) Information from Miami County Transit System.
Miami County Public Transit Service, 2007
Average Daily Ridership Compared to the Senior Population, 2030

Figure 5-5: Miami County Public Transit Service Locations Compared to the Anticipated 2030 Total Population

Legend
Miami County Average Daily Trips
by frequency of origination/destination
- Less than one trip daily
- 1-9 trips daily
- 20-49 trips daily

Senior Population, by Census Tract
Expressed as Persons per Sq.Mi.
- 0-100
- 100-375
- 375-750
- 750-2,800

Source:
U.S. Census Bureau 2000, Summary File 3
Ohio Department of Development, Office of Strategic Research, Population Projections for Ohio Counties by Age and Sex: 2000 to 2030, March 2004
Miami County Public Transit
Miami County Public Transit Service, 2007
Average Daily Ridership Compared to the Population below Poverty, 2030

Figure 5-6: Miami County Public Transit Service Locations Compared to the Anticipated 2030 Population below the Poverty Level
6
MAJOR REGIONAL DESTINATIONS

EMPLOYMENT CENTERS

The counties comprising the Miami Valley Regional Planning Commission (MVRPC) region are home to over 37,000 business establishments, nearly all of which (93.6%) are very small businesses employing 1 to 49 people (Table 6-1). It should be noted that employment databases typically include civilian defense workers but not military workers, and so the Miami Valley region’s employment totals are understated. Specifically, the premier employment center in the Miami Valley region is Wright-Patterson Air Force Base — the largest single-site employer in the State of Ohio — which employs over 20,000 people. The composition of the civilian and military workforce has become more concentrated by scientists and engineers over time, as the Base has outsourced most of its building and grounds maintenance and other lower skilled services to private contractors. Outsourcing makes it difficult to analyze the full composition of the workforce supporting the Base’s mission, or the origins and destinations of its workforce.

Table 6-1:
EMPLOYMENT FOR ALL EMPLOYERS

<table>
<thead>
<tr>
<th>Number of Employees per Employer</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 49</td>
<td>34,919</td>
<td>93.6</td>
<td>93.6</td>
</tr>
<tr>
<td>50 to 99</td>
<td>965</td>
<td>2.6</td>
<td>96.2</td>
</tr>
<tr>
<td>100 to 249</td>
<td>570</td>
<td>1.5</td>
<td>97.7</td>
</tr>
<tr>
<td>250 to 499</td>
<td>106</td>
<td>0.3</td>
<td>98.0</td>
</tr>
<tr>
<td>Over 500</td>
<td>83</td>
<td>0.2</td>
<td>98.2</td>
</tr>
<tr>
<td>Unknown</td>
<td>657</td>
<td>1.8</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>37,300</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


Besides the Air Force Base’s employment, entry level employment opportunities can be identified among private employers in the Miami Valley region (Table 6-2). The fact that a large portion of all employees (21,913/37,300 persons or 59% of the lower-skilled labor force) can be
considered in lower skilled industries suggests the influence of the service sectors on the regional employment base. As the service economy has grown, so has the number of lower skilled occupations that require entry level training.

Table 6-2:
ENTRY-LEVEL EMPLOYMENT

<table>
<thead>
<tr>
<th>Entry-level Employees per Employer</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 49</td>
<td>20,880</td>
<td>95.3</td>
<td>95.3</td>
</tr>
<tr>
<td>50 to 99</td>
<td>575</td>
<td>2.6</td>
<td>97.9</td>
</tr>
<tr>
<td>100 to 249</td>
<td>313</td>
<td>1.4</td>
<td>99.3</td>
</tr>
<tr>
<td>250 to 499</td>
<td>68</td>
<td>0.3</td>
<td>99.6</td>
</tr>
<tr>
<td>Over 500</td>
<td>50</td>
<td>0.2</td>
<td>99.9</td>
</tr>
<tr>
<td>Unknown</td>
<td>27</td>
<td>0.1</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21,913</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


Employment databases, such as Powerfinder, do a very good job of capturing private employers, including sole proprietorships. Geocoding the largest private establishments demonstrates the concentration of major employers in the region. Figure 6-1 presents establishments that employ over 500 people. The location of these largest employment centers emphasizes the importance of access, as most of these employment centers are located along the major interstates and state routes — I-75, I-70, I-675, and SR 35.

The vast majority of these major employment centers are located in Montgomery County, which also has the region’s only public transportation system. The public transportation system is aligned well with these major employment centers, and crosses county boundaries into Greene County to take workers to Wright-Patterson Air Force Base and to Wright State University in northern Greene County, takes workers to the Miami Valley Research Park proximate to mid-Greene County, and takes workers to the edge of the major retail center, the Greene, in southern Greene County, among other locations.

Regarding the workforce, projections of where dense populations will reside are also presented in Figure 6-1 below. While concentrations of workers in Montgomery County will likely continue to have access to the major employment centers, the workforce in Warren County, which is projected to grow tremendously, will not have such access. Concentrations of workers in Greene County can be served by Greene CATS, the demand response transit service for that County. Greene CATS’ location of a flex route between Fairborn and Xenia is corroborated by the map, which shows a growth in the concentration of population in those two cities as well as major employers anchoring both ends of that route.
Greene, Miami, Montgomery, Preble, and Northern Warren Counties:
Largest Employers (500+ Employees) in 2007 by Employment Related to the Total Population, 2030

Figure 6-1: Miami Valley’s Largest Employers

Legend
Employers
- 500+ Employees
Total Population
Expressed as persons per Sq.Mi.
- 0 - 500
- 500 - 1,700
- 1,700 - 4,000
- 4,000 - 9,209

Sources:
U.S. Census Bureau, Census 2000, Summary File 3;
Ohio Department of Development, Office of Strategic Research, Population Projections for Ohio and Counties by Age and Sex: 2000 to 2030, March 2004,
Figure 6-2 presents employment centers from another vantage point—that of business district land use designations. The value of this map is that it indicates the type of major employment center: commercial, industrial, mixed, public/institutional, and transportation, which can be associated with staffing pattern data to indicate the type of workforce required. The dominating areas on the map are Wright-Patterson Air Force Base as the most significant public/institutional site and the Dayton International Airport as the most significant transportation site.

Under the radar screen in these first two maps is the dislocated worker situation currently facing Montgomery County. In 2006 alone, 9,600 manufacturing workers lost their jobs and most of these workers live in Montgomery and Greene Counties (Figures 6-3 and 6-4). More opportunities for work in the traditional manufacturing industry are now in Miami and Warren counties and further northeast and will be in the southwest due to Honda locations. The region faces a great challenge in connecting its vast displaced worker population to job opportunities.
Figure 6-2: Miami Valley Employment Centers by Type

Legend
Business Districts by land use classification
- Commercial
- Industrial
- Mixed Urban or Built-up Land
- Public/Institutional
- Transportation

Sources:
Miami Valley Regional Planning Commission, land use data/shapefile
U.S. Census Bureau, Census 2000, Summary File 3
Figure 6-3: General Motors Employees by Zip Code of Residence, 2006
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: Delphi Employees by Zip Code of Residence, 2006

Figure 6-4: Delphi Employees by Zip Code of Residence, 2006
HEALTH AND HUMAN SERVICES

Healthcare Industry Perspectives

Nationally, healthcare construction will experience the strongest growth among industries (double-digit annual growth each year) through 2011.\(^7\) The long-term and growing demand for healthcare services are expected to rise significantly as Baby Boomers move toward retirement.\(^8\) Demand drivers are primarily population- and demographic-oriented (e.g., the aging population, increasing life expectancy, and increased birth rates).\(^9\)

According to the 2001 Health Care Business Market Research Handbook, ambulatory care is the fastest growing segment of the healthcare marketplace.\(^10\) Technological advances also changed the delivery of cancer treatments to mostly an outpatient basis spurring an increase in the number of ambulatory-care cancer centers. Changes in “reimbursement, increased competition, and delivery of ambulatory care services have impacted the way facilities have and will be developed, built and operated. Despite these increases, experts believe the field of outpatient cancer centers is far from saturation.”\(^11\) According to Russ Coile’s Health Trends, access and convenience will continue to be critical success factors in ambulatory care as demand is projected by site and built according to retail marketing theory\(^12\), which emphasizes that medical service consumers will be attracted to a diverse choice of care providers located within a convenient distance from their home. Given the Miami Valley’s decentralized population, this relatively new trend has far-reaching implications for the dispersal of health care services in the region.

Recent Healthcare Developments in the Miami Valley Region

With this in mind, a trend toward decentralization of the medical community can also be witnessed across the Miami Valley. Where hospitalization in the central city was the only option for surgical and cancer treatment at one time, the trend in the Miami Valley has also been to disperse medical treatment facilities to the suburbs. Recent full-service additions to the Miami Valley medical community include, the Atrium in Middletown, Miami Valley South Medical Center, and the expansion of the Kettering Medical Center physician offices and testing facility making the patient connection to treatment more convenient in Northern Warren, Bellbrook/Centerville/Southern Kettering area, and Beavercreek.

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\(^7\) Jones, Heather, 2008 Industry Forecast: Keeping Pace in ’08, Construction Today. 28 November 2007
The Atrium Medical Center, a 250-bed full-service hospital opened in December 2007 to replace the aging Middletown Regional Hospital. Upon completion, the 190-acre health care campus will include a Children's Medical Center of Dayton outpatient center, physician offices, a comprehensive cancer treatment center, an outpatient surgery center, a YMCA, an Otterbein Homes senior living development, and the Greentree Health Science Academy.

In October of 2007, Miami Valley Hospital opened the doors of the new Miami Valley South Health Center centrally located to the Bellbrook, Centerville and southern Kettering communities. The new facility will house a variety of services for southern Miami Valley residents including a 24-hour emergency department, a breast center with digital mammography, cardiac diagnostics, laboratory services, and CT, MRI, and ultrasound services.

Kettering Health Network is currently undertaking the expansion of their Beavercreek Facility behind the Mall at Fairfield Commons. The current facility provides Physician, Pharmacy, MRI, CAT Scan, X-Ray, Lab Services, Physical Medicine, Rehabilitation, Occupational Health, Health Screenings, and Ultrasound services. The new facility is “likely to be a "mirror" of the existing 45,000-square-foot building”

Greene Memorial Hospital and Greene Health Partners are considering building a new facility in Greene County. “Greene Health Partners is concerned that population changes and roadway development during the past 50 years have altered Greene Memorial's ability to reach all of Greene County. The current facility isn't as accessible to the western part of the county, which is one of the driving forces in site location for any new facility.”

**Linking Miami Valley Residents to Health Care**

*Montgomery County*

Within the core urban area of Montgomery County, the population is served by regular service routes provided by the Greater Dayton Regional Transit Authority (GDRTA). These service routes/areas serve the densest populated areas in Montgomery County, as well as most areas where medical professional offices, ambulatory care centers, and hospitals in the county exist. Limited trips are made to the smaller villages or incorporated jurisdictions and no regular routes are provided to the rural population and the rural residents have very limited, if any, transit options for clients. In addition, if treatment is necessary in one of the surrounding counties, connection to these services is not possible. Data provided by the GDRTA and associated with the physical location of the health care industry indicate that the general RTA route structure aligns with current health care industry locations. Figure 6-5 demonstrates that

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13 Partnership between the Atrium, Butler Technology and Career Development Schools, Warren County Career Center and Miami University to help prepare students for healthcare careers.


many current major and minor health care providers are located along GDRTA routes. The trend in the Miami Valley to disperse medical treatment facilities to the suburbs may mean that there will be less overall accessibility to healthcare facilities using fixed route public transit services in the future.

Project Mobility provides ADA complementary paratransit service to Montgomery County residents with certified disabilities who are unable to use regular fixed routes. Project Mobility provided approximately 300,000 trips in 2006. In order to use the service, individuals must be certified as ADA paratransit-eligible by the Project Mobility Certification Center. There are no restrictions on trip purpose, but all trips must take place within a ¾ mile corridor on each side of a fixed route. The hours of service will match the hours of service on the adjacent bus routes. Trips must be requested no later than the day before the trip. The fare is $2.00 per one-way trip.

Growth patterns indicate that the population with disabilities will continue to be densest within the paratransit service area, but will increase by 5.5% by 2030, requiring additional service, but not an expanded service delivery area.

Senior EZ Ride options provide a necessary transportation link to senior citizens centers, medical care providers, and pharmacies. Senior EZ Ride Routes run Tuesdays and Thursdays serving the Northwest Dayton and Trotwood area and Mondays and Wednesdays routes serving the Southeast Dayton and Kettering area of Montgomery County. (See Figure 6-6.) However, as the population ages through the year 2030, service delivery for seniors should expand to meet the needs of the growing population. Anticipated growth patterns (up 37% from 2000 to 2030) indicate that expanded service will be necessary to connect seniors to services for the Northwest Route to serve Western Dayton and to the Southeast Dayton route to the communities of Riverside, Oakwood, Centerville, Miamisburg, and Washington Township and throughout the Kettering area. In addition to these expansions, new routes may need to be added to the Northern portion of the County to serve the cities of Huber Heights, Vandalia, Brookville, and Englewood. As mentioned previously, if medical treatment is necessary from a facility or professional outside the county, connection to these services is not possible.

17 Greater Dayton Transit Authority.
Figure 6-5: Health Care Establishments in Relation to GDRTA Routes

Sources:
U.S. Census Bureau, Census 2000, Summary File 3;
Greene, Miami, Montgomery, Preble, and Northern Warren Counties: All Health Establishments (2007) Related to the GDRTA Senior EZ Ride

Figure 6-6: GDRTA Senior EZ Ride
**Greene County**

In Greene County, the Greene CATS demand-response transportation system is open to the general public to and from any destination in Greene County; limited service to medical facilities in Montgomery County is also offered. The demand-response system often operates at capacity during peak times, resulting in some trip denials. Reservations must be made no less than one business day in advance to request regular curb-to-curb or disability door-to-door service assistance. Service hours are limited to 6 a.m. – 6 p.m. 362 days per year providing access to most non-emergency medical necessities. So as long as testing or treatment can be scheduled with enough advance notice, the public transportation connection is possible. Greene CATS has recently added flex-route service in and between Fairborn and Xenia, and the service has been well received.

Looking to the future, the Greene County population is expected to grow 7.4% from 2000 to 2030 creating an increasing need for public transportation. Xenia and Fairborn will continue to exhibit higher levels of poverty than other Greene County communities, thus requiring a higher level of service. With the growth of medical service facilities along the western edge of the county providing greater access to medical services, another limited regular service route may be necessary to connect the population to the medical community. The population in Greene County will also be aging in place and needing accessible and convenient modes of transportation to and from senior centers, pharmacies, and medical services.

**Miami County**

The Miami County Public Transit demand-response system serves the entire county providing transportation for all Miami County residents including, low-income, elderly and disabled individuals anywhere in Miami County with limited connection into the Montgomery County system in Vandalia and Huber Heights. Reservations must be made one to two hours in advance. Service hours are limited to 5 a.m. – 11 p.m. Monday through Friday 6 a.m. to 7 p.m. on Saturdays, and 8 a.m. to 2 p.m. Sundays. 18

Looking to the future, the Miami County population is expected to grow 9.2% and will witness a dramatic increase in the number of seniors aging in place (56.9%) from 2000 to 2030. These factors will fuel an increasing demand for public transportation and possibly the establishment of a regular route to connect seniors to senior centers, pharmacies, and medical services.

**Preble County**

In Preble County, public transportation is not provided to residents for access to medical services which are predominantly available outside the county. Access to services will need to be addressed both now and in the future for the general and special populations.

**Warren County**

In Warren County, public transportation is provided on a very limited basis, at the same time the health care infrastructure is expanding. And while medical facilities and services are being developed and opened

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18 Miami County Public Transit
across this rapidly developing county, public transportation connecting the general and special populations to medical services still needs to be addressed both now and in the future.

**Linking Miami Valley Residents to Human Services**

As was the case with health care destinations, the location of human services in Montgomery County appears to align well with the existing GDRTA route structure. As the population ages through the year 2030, service delivery for seniors will need to expand to meet the needs of this growing segment of the population (Figure 6-7). Anticipated growth patterns for the senior population (up 37% from 2000 to 2030) indicate that expanded service will be necessary to connect seniors to services for the Northwest Route to serve Western Dayton and to the Southeast Dayton route to the communities of Riverside, Oakwood, Centerville, Miamisburg, and Washington Township and throughout the Kettering area. In addition to these expansions, new routes may need to be added to the Northern portion of the County to serve the Cities of Huber Heights, Vandalia, Brookville, and Englewood.

**COLLEGE AND TECHNICAL EDUCATION**

In the Miami Valley, residents have opportunities for continued adult education through thirty-seven traditional and non-traditional technical training, two-year college, and 4-year college institutions. Residents served by public transportation have access to these educational opportunities. However, in Preble and Warren Counties, transportation connecting the population to post-secondary training and education is extremely limited.

**Montgomery County**

Within the core urban area of Montgomery County, the population is served by twenty-one¹⁹ post secondary and vocational facilities. Locations include:

- Carousel Beauty College
- Data Skills Inc.
- 

Greene, Miami, Montgomery, Preble, and Northern Warren Counties:
All Human Services Establishments Related to GDRTA Senior EZ Ride Routes, 2007

Figure 6-7: Human Services Establishments in relation to GDRTA Senior EZ Ride Routes
• International College of Broadcasting
• Miami Valley Career Technology Center
• School of Advertising Art
• Summit Academy

• Two-year Campuses
  o Miami-Jacobs College
  o Ohio Institute of Photography and technology
  o Sinclair Community College

• Branch Campuses
  o Capital University
  o Central Michigan University
  o Central State University
  o Indiana Wesleyan University
  o Nyack College
  o University of Phoenix Dayton
  o Urbana university

• Andrews University
• Beacon University
• Kettering College of Medical Arts
• United Theological Seminary
• University of Dayton
• Wright Patterson Air Force Base, Embry-Riddle Aeronautical University

Regular service routes provided by the Greater Dayton Regional Transit Authority (GDRTA) connect the population that has access to the routes to all of the educational opportunities within Montgomery County and to Wright State University in Greene County.

Although the population is not expected to grow in Montgomery County, the need for public transportation is expected to remain constant. Currently, Montgomery County provides opportunities to connect residents to educational opportunities, however, the rural area of the county does not have the access to these opportunities that the remainder of the county does. This should be examined now and in the future to provide greater access to the individuals along the western edge of Montgomery County and possibly the region.

Greene County

In Greene County, residents have access to eleven training and education opportunities:\n
• Antioch

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and, available on Wright Patterson Air Force Base,

- Central Michigan University
- Air Force Institute of Technology.

All of Greene County’s public transportation needs are met through the Greene CATS demand-response system, which is open to the general Greene County public to and from any destination in Greene County with limited service to facilities in Clark and Montgomery Counties. Reservations must be made no less than one business day in advance to request service and service hours are limited to 6 a.m. – 6 p.m. 362 days per year, limiting student access to evening and classes extending beyond the six o’clock deadline.

Looking to the future, the Greene County population is expected to grow 7.4% from 2000 to 2030 creating an increasing need for public transportation. Xenia and Fairborn will continue to exhibit higher levels of poverty than other Greene County communities, thus requiring a higher level of service. With the growth of educational service facilities along the western edge of the county, another limited regular service route and longer service hours may be necessary to connect the population to educational opportunities. In addition to this need, a need exists to connect the population to the educational opportunities in Montgomery County.

**Miami County**

Miami County Public Transit demand-response system serves the entire county providing transportation for all Miami County residents anywhere in Miami County with limited connection into the Montgomery County system in Vandalia and Huber Heights. Reservations must be made one to two hours in advance. Service hours are limited to 5 a.m. – 11 p.m. Monday through Friday 6 a.m. to 7 p.m. on Saturdays, and 8 a.m. to 2 p.m. Sundays and provide adequate coverage for most individuals to attend the classes of their choice at county educational facilities — Hobart Institute of Welding in Troy and in Piqua, Edison State Community College and the Upper Valley Vocational School.

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21 Miami County Public Transit
Looking to the future, the Miami County population is expected to grow 9.2% from 2000 to 2030. These factors will fuel an increasing demand for public transportation and possibly an increased demand to regional educational opportunities unavailable in Miami County.

**Warren County**

In Warren County, public transportation is provided on a very limited basis. Only one educational facility exists to serve the population within the Northern Warren County Service area discussed in this report—the Southwestern College of Business. In the fall of 2007, Sinclair opened the new Warren County Courseview campus south of State Route 741 near King’s Island. The new campus is expected to enroll 300–500 students the first year and was designed to provide the flexibility to accommodate up to 10,000 additional students.22 “President Steve Johnson said he's expecting to have 35,000 students (enrolled at the Warren County and Montgomery County campuses) by the year 2025.”23 Sinclair is also partnering with area higher education partners — the University of Cincinnati Pathways Program (provides affordable baccalaureate education and easy transition to the UC Campus) and the University of Dayton which provides graduate opportunities in education. Discussions are also happening with Wright State University, Wilmington College, and Great Oaks Technical Career Center.24

In December 2007, the Atrium Medical Campus opened to replace the aging Middletown Regional Hospital. Upon completion, the campus will include the Greentree Health Science Academy — a partnership between the Atrium, Butler Technology and Career Development Schools, Warren County Career Center, and Miami University.25

Warren County does not provide regular or demand-response public transportation to connect residents to educational opportunities. Although educational facilities and services are being developed in the county providing more convenient access, public transportation connecting the general and special populations to educational opportunities still needs to be addressed both now and in the future. Future examination may also need to be made to connect the students attending the Courseview Campus to the University of Cincinnati Campus which provides the Warren County campus student the opportunity to further their education to a four-year degree.

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Educational Opportunities in the Miami Valley Region

Looking to the future, the Miami Valley Region has a rich and diverse educational community offering training and degree opportunities in a variety of vocations and careers. What is missing is the link from the population to the classroom. Regional educational opportunities exist but regional transportation to connect the students to these resources does not. These factors will fuel an increasing demand for public transportation which transcends county boundaries.
APPENDIX A:
POPULATION FORECASTING METHODOLOGY
APPENDIX A:
POPULATION FORECASTING METHODOLOGY

BACKGROUND

This document contains information on acquisition and sources of data and the methodologies for the development of population forecasts for the Miami Valley region through 2030. For each demographic variable, methodology and key planning assumptions on the limitations of the forecasts are provided. The technique for forecasting Census Tract populations is either a ratio or shift-share procedure, which are then summed or forced to fit to the total population projection as provided by the State of Ohio Department of Development. Age cohorts selected from the Ohio Department of Development projection process are defined as seniors (ages 65 and over), employment eligible (ages 16 through 64), and youth (ages 5-15).

DATA ACQUISITION

Population Data

2000 counts and 2030 population and housing projections were provided by the Miami Valley Regional Planning Commission (MVRPC) at the Census Traffic Analysis Zone (TAZ) Level. However, this study is based on the Census Tract level rather than the TAZ level, because the demographic data necessary for analysis is available at the Census Tract level for all counties in the analysis. Therefore, 1990 and 2000 population data were collected for the Miami Valley Region at the Census Tract Level from the Decennial Census of Population and Housing, and formed the basis for the projections.

Geographic Data

1990 and 2000 Census Tract geography files for the Miami Valley Region were obtained from the Geography Network ESRI Data and Maps TIGER/Line Data (NAD 1927 converted to Ohio State Plane South NAD 83 Meters). County (2004), city (2004), township (2004), and road (2007) data were obtained from the State of Ohio Department of Transportation Statewide Digital Data (Ohio State Plane South NAD 83 Meters). Traffic Analysis Zone (TAZ) geography files were obtained from the Miami Valley Regional Planning Commission.
CONCEPTS AND DEFINITIONS

Census Household and Demographic Information

Definitions for the following characteristics come directly from the Census Bureau website and are copied directly from the Census Bureau Glossary or data information in their entirety.

Age — the age classification is based on the age of the person in complete years as of April 1, 2000. The age of the person usually was derived from their date of birth information.

Disability — A long-lasting physical, mental, or emotional condition. This condition can make it difficult for a person to do activities such as walking, climbing stairs, dressing, bathing, learning, or remembering. This condition can also impede a person from being able to go outside the home alone or to work at a job or business.

The 2000 questions changed significantly from the 1990 questions. New 2000 questions cover the major life activities of seeing and hearing and the ability to perform physical and mental tasks.

These questions collect data on the disability status of children 5 years and over as well as adults. The 1990 questions collected data only for persons 15 years and over.

Poverty — The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family’s total income is less than the family’s threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using the Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps).

The poverty universe is defined as persons for whom the Census Bureau can determine poverty status (either "in poverty" or "not in poverty"). For some persons, such as unrelated individuals under age 15, poverty status is not defined. Since Census Bureau surveys typically ask income questions to persons age 15 or older, if a child under age 15 is not related by birth, marriage, or adoption to a reference person within the household, we do not know the child's income and therefore cannot determine his or her poverty status. For the decennial censuses and the American Community Survey, poverty status is also undefined for people living in college dormitories and in institutional group quarters. People whose poverty status is undefined are excluded from Census Bureau poverty tabulations. Thus, the total population in poverty tables—the poverty universe—is slightly smaller than the overall population.

Poverty Rate— The percentage of people (or families) who are below poverty.
**Poverty Thresholds** – Dollar amounts the Census Bureau uses to determine a family's or person's poverty status.

**Ratio of Income to Poverty** — People and families are classified as being in poverty if their income is less than their poverty threshold. If their income is less than half their poverty threshold, they are below 50% of poverty; less than the threshold itself, they are in poverty (below 100% of poverty); less than 1.25 times the threshold, below 125% of poverty, and so on. The greater the ratio of income to poverty, the more that fall under the category, because higher ratios include more people with higher incomes.

**Labor Force Information**

**Civilian Noninstitutional Population** — In the CPS, labor force data are restricted to persons 16 years of age and older, who currently reside in 1 of the 50 states or the District of Columbia, who do not reside in institutions (e.g., penal and mental facilities, homes for the aged), and who are not on active duty in the Armed Forces.

**Employed Persons** — Employed persons are those who, during the reference week (a) did any work at all (for at least 1 hour) as paid employees; worked in their own businesses, professions, or on their own farms; or worked 15 hours or more as unpaid workers in an enterprise operated by a family member or (b) were not working, but who had a job or business from which they were temporarily absent because of vacation, illness, bad weather, childcare problems, maternity or paternity leave, labor management dispute, job training, or other family or personal reasons whether or not they were paid for the time off or were seeking other jobs. Each employed person is counted only once, even if he or she holds more than one job. (See the discussion of multiple jobholders below.)

**North American Industry Classification System (NAICS)** — Codes are used to classify establishments by their primary economic activity so data can be compared for describing various industries.

**Standard Industrial Classification (SIC) code system** — Codes are used to classify establishments by their primary economic activity so data can be compared for describing various industries.

**POPULATION FORECAST METHODOLOGY**
The population projections for the Miami Valley Region — Greene, Miami, Montgomery, and Warren Counties — were made using four different simple projection methods to project population characteristics from Census data collection year 2000 for Census Tract populations to 2010, 2020 and 2030. In each method, the county population projection for the population age cohort being studied was calculated using the Ohio Department of Development projection for 2010, 2020, and 2030, which were used as the control totals. The resulting calculations of the four methods were reviewed and where population resulted in a negative population count the projection methodology was rejected.

Census Tract population projections begin with the following data inputs.


The four ratio methods used are presented below.

**Constant Share** or Ratio Method

Population projected counts for the Census Tracts are calculated by holding the Census Tract’s share of the population constant and applying this share to the projection of the County control.

\[ P_{it} = \left(\frac{P_{il}}{P_{jl}}\right)P_{jt} \]

- \( P \) = population
- \( i \) = Census Tract
- \( j \) = County
- \( l \) = launch year, 2000
- \( t \) = targeted projection year.

**Shift Share**

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27 The resulting calculations are based on the mathematical projection of existing Census trends and do not take into account any future policy decisions affecting development density or economic trends affecting population distribution.

Population projected counts for the Census Tracts are extrapolated by calculating the Census Tract’s share of the population for the base year (1990), the share of the Census Tract’s population for the launch year (2000), and controlling this shift to the projection of the County control. The calculations produced results less than zero for Census Tract-projected populations where population growth from the base period to launch period was very slow or declined and this methodology was rejected.

\[ P_t = P_i \left[ \frac{P_i}{P_j} + \frac{(z/y)(P_i/P_j - P_b/P_j)}{P_i/P_j} \right] \]

\( P \) = population

\( i \) = Census Tract

\( t \) = targeted projection year

\( j \) = County

\( b \) = base year, 1990

\( l \) = launch year, 2000

\( z \) = number of years in the projection horizon

\( y \) = number of years in the base period.

**Share of Growth**

In this method, it is assumed that the Census Tract’s share of the growth will remain constant (base to launch period) over time controlling this shift to the projection of the County for each of the targeted periods. The calculations produced results less than zero for Census Tract-projected populations and this methodology was also rejected.

\[ P_t = P_{i} + \left[ \frac{(P_i-P_b)}{(P_j-P_{jb})} \right] (P_{jt}-P_{jl}) \]

\( P \) = population

\( i \) = Census Tract

\( t \) = targeted projection year

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j = County

b = base year, 1990


Shift Share Method 2

Population projected counts for the Census Tracts are extrapolated by calculating the Census Tract’s share of the population for the base year (1990), the share of the Census Tract’s population for the launch year (2000), and controlling this shift to the projection of the County control (ODOD Projections for the years 2010, 2020, and 2030).

Calculation of the Shift Share:

(1) Census Tract Share 1990 = \( P_{ib}/P_{jb} \)

(2) Census Tract Share 2000 = \( P_{il}/P_{jl} \)

(3) Shift = (2)-(1)

(4) 10 Year Shift = (2)+(3)

(5) 20 Year Shift = (2)+2*(3)

(6) 30 Year Shift = (2)+3*(3)

(7) 2010 Control = Ohio DOD 2010 County Population/Resulting 2010 County Population

(8) 2010 Population Control Adjustment = (4)*(7)

(9) 2020 Control = Ohio DOD 2020 County Population/Resulting 2020 County Population

(10) 2020 Population Control Adjustment = (5)*(9)

(11) 2030 Control = Ohio DOD 2030 County Population/Resulting 2030 County Population

(12) 2030 Population Control Adjustment = (6)*(11)

31 Chapin, Tim. Forecasting for Plan Development, Florida State University, Department of Urban and Regional Planning, January 2004.
This method was used to calculate all or a portion of the estimates for each of the demographic variables examined — total population, senior population, the senior population with disabilities, the population ages 5-64 with disabilities, and the low-income population. A description of the variations necessary to calculate the forecasted populations is detailed below.

**SPECIFIC CALCULATIONS**

**Total Population**

The forecasted Census Tract populations were calculated using the 1990 and 2000 Total Census Tract populations and controlled to fit the 2010, 2020, and 2030 ODOD total county population. However, upon review of the 2030 MVRPC forecasted housing development data, the researchers rejected the results generated for the total population. The mathematical model did not produce results reflecting the change in population in the developing portions of the Miami Valley Region.

Instead, the 2030 total population was recalculated using the MVRPC TAZ Level projections for the total population. Population-based areal interpolation was calculated using the ArcGIS Areal Interpolator Extension developed by the Long Island Geographic Information System for the National Cancer Institute. The Areal Interpolator weights and summarizes the data of the TAZ Level or subpolygons proportionally to the ratio of partial Census Tract polygon the TAZ area fills. The flaw to this methodology is that it assumes the data are uniformly distributed throughout the TAZ polygon. Geographically, the resulting calculations are considered reasonably representative of the expected development and population change on the Greene, Montgomery, and Miami Counties. No TAZ Level data were available to recalculate the results for Preble County and insufficient data were available to recalculate all of the Census Tract area represented in the maps in Warren County.

**Seniors**
The forecasted Census Tract populations were calculated using the 1990 and 2000 total Census Tract senior populations and controlled to fit the 2010, 2020, and 2030 ODOD Total county senior population.

The forecasted Census Tract disabled senior populations were calculated using the 1990 and 2000 Total Census Tract Senior populations with and without disabilities and controlled to fit the 2010, 2020, and 2030 ODOD Total County senior population. It is necessary to calculate the population with and without disabilities simultaneously to be able to control the population to the total senior population.

The researchers accept the results of the senior projections despite the fact population growth due to new housing development is not represented, because of the large number of seniors believed to be “aging in place.”

**Disabled Population**

The forecasted Census Tract populations were calculated using the 1990 and 2000 Total Census Tract Disabled Populations and controlled to fit the 2010, 2020, and 2030 ODOD Total County senior population.

The forecasted Census Tract disabled populations were calculated using the 1990 and 2000 Total Census Tract populations with and without disabilities for all age cohorts between the ages of 5 and 64 and controlled to fit the 2010, 2020, and 2030 ODOD Total County disabled population for ages 5 to 64. It is necessary to calculate the population with and without disabilities simultaneously to be able to control the population to the total cohort population. In addition to the simultaneous calculations, one important difference exists in the calculation methodology compared to the other methods. For the Census Cohort Ages 5-15, 1990 data is not available for the population with disabilities and a simple ratio of the 2000 population with and without disabilities was used to calculate the population for this cohort.

The mathematical forecasts of the Census Tract population do not reflect the trends in housing development, but insufficient data is available to redistribute the disabled population based on future housing development.

**Low-income Population**

The forecasted Census Tract populations were calculated using the 1990 and 2000 Total Census Tract Populations for all Income to Poverty Ratio Levels and controlled to fit the 2010, 2020, and 2030 ODOD total county population.

The forecasted Census Tract low-income populations were calculated using the 1990 and 2000 Total Census Tract Populations, all Income and Poverty Levels, simultaneously and controlled to fit the 2010, 2020, and 2030 ODOD total county population. It is necessary to
calculate the population at all income levels simultaneously to be able to control the population to the total population.
REFERENCES

U.S. Census Bureau; Census 2000, Summary File 1 and Summary File 3; generated by Carol Hooker; using American FactFinder; <http://factfinder.census.gov>; (August 2007)

U.S. Census Bureau; 1990 Census of Population and Housing, Summary Tape File 1 and Summary Tape File 3; generated by Carol Hooker; using American FactFinder; <http://factfinder.census.gov>; (August 2008).


Chapin, Tim. Forecasting for Plan Development, Florida State University, Department of Urban and Regional Planning, January 2004.

The Ohio Economic Development Information Network (OEDIN), Quarterly Census of Employment and Wages (ES202)