



## City of Mason, Ohio



# Mason Bicycle and Pedestrian Way Master Plan - 2001

City of Mason, Ohio

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# I. INTRODUCTION

## A. *Plan Purpose*

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In its continuing effort to provide a high quality of life and recreational opportunities for its residents, the City of Mason has created the 2001 Bicycle and Pedestrian Way Master Plan as a decision making tool to guide the development of new bicycle and pedestrian facilities. This is the City's first adopted bicycle and pedestrian master plan.

The formulation of this plan was driven by a combination of factors at the national, state, and local level. First, and most important, is the recent support and requests from the residents of Mason to have access to safe and convenient non-motorized transportation. In response to public sentiment, City Council and staff provided the necessary resources to plan and develop a premier bicycle and pedestrian network.

Second, the U.S. Department of Transportation recently promulgated its goal "to double the current percentage (from 7.9% to 15%) of total trips made by bicycling and walking" in the *National Bicycling and Walking Study*. This report lists several benefits to increase walking and bicycling in America. These benefits include: increasing opportunities for recreation, physical fitness and well being; decreasing auto related noise and air pollution; and conserving natural resources. Though not a goal at the national level, bicycling and walking is important at the local level to foster community relations and a deeper sense of community.

Finally, it is an opportune time to plan for bicycle and pedestrian facilities as non-motorized transportation programs and funding are increasingly more accessible. The most notable examples include the federal government's Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21) and the State of Ohio's Clean Ohio Fund (Issue I).

### ***Plan Goals***

The City ascribed three main goals to this plan in order to guide the development of a well planned and designed bicycle and pedestrian network. These goals are:

- *To identify safe linkages between Mason's neighborhoods, parks, open spaces, schools, and areas of civic and cultural importance, and to identify viable linkages to the regional bicycle path network.*
- *To prioritize funding and facility construction in a manner that is fiscally responsible and realistically feasible.*
- *To develop a design manual to guide the development of the Mason non-motorized transportation network.*

## **B. Planning Process**

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### ***Planning Participants***

- **Mayor and City Council:** The Mayor and City Council gave the directive and provided the resources to prepare this plan. City Council also held a public hearing, considered public comments, and adopted the plan.
- **Steering Committee:** A steering committee, consisting of eight (8) community stakeholders, was established to oversee the development of the plan. Each committee member had a unique background and interest in bicycle and pedestrian facilities. Collectively, the steering committee represented a cross-section of Mason's population.

The steering committee met on a regular basis over a six (6) month period. At these meetings, strategic issues regarding Mason's future bicycle and pedestrian system were discussed. These issues included such topics as: identifying likely user groups and appropriate facility design to accommodate the defined user groups; identifying ideal path locations and routes; and prioritizing projects, etc.

- **Engineering and Building Department:** The City Engineer, City Planner, and Subdivision Engineer from the Mason Engineering, Building, and Planning Department provided guidance, direction, and support throughout the planning process. They reviewed plan drafts and offered many insightful suggestions. Their knowledge of Mason's physical characteristics was invaluable.
- **Project Consultants:** McKenna Associates, Incorporated and LJB, Incorporated were retained by the City to assist in the preparation of the plan.

### ***Approval Process***

The steering committee presented the plan to the City Planning Commission on July 10, 2001. A public hearing was held on the same day. After the public hearing was closed, the Planning Commission made a recommendation to approve the plan to City Council. On August 13, 2001, City Council held a public hearing, and upon hearing no objections, the City of Mason Bicycle and Pedestrian Way Master Plan was adopted.

## **C. Plan Organization**

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The information and recommendations found in this plan are included within one of four components. These components are described below.



## ***Plan Components***

- **Inventory and Analysis:** The recommendations in this plan are based on an extensive inventory and analysis of Mason's demographic, physical, and transportation characteristics.

Thus, the first step in the planning process involved gathering information about Mason and analyzing that information for meaningful conclusions. Section II Community Description and Section III Inventory of Existing Facilities contain the preponderance of community background information and analysis.

- **Action Plan:** Section V Action Plan and Capital Improvement Schedule contains the bulk of the recommendations found in this report, including the location and prioritization of new bicycle and pedestrian facilities. A capital improvement plan is included in Section V that provides the City with project cost estimates. This information will help the City budget for pedestrian and bicycle related expenditures.
- **Implementation Strategies:** This component, found in Section VI, describes the tools available to implement the plan. A series of recommendations are made on financing strategies, grants, and ordinance revisions which the City can choose from to achieve plan goals and objectives.
- **Design Manual:** Section VII Design Manual is provided to guide the physical development of planned facilities as the plan is implemented. The manual contains standards that are modeled after design standards set by the American Association of State Highway and Transportation Officials (AASHTO). Most illustrations in the Design Manual are taken from the 2000 *Bicycle Friendly Manual* prepared by Edsall and Associates, LLC.

## ***D. Plan Focus***

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This plan attempts to integrate bicycle and pedestrian facility planning in one document. Focusing on both facility types represents a challenge as bicyclists and pedestrians have unique and dissimilar needs and characteristics. A special effort was made to ensure that both modes of non-motorized transportation received full consideration in this report. More emphasis, however, is given to planning for bicycle facilities than sidewalks. This is consistent with the purpose and goals of this plan.

## **II. COMMUNITY DESCRIPTION**

### ***A. Location***

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The City of Mason is located in the west-central portion of Warren County in Southwest Ohio. Mason is also centrally located between Cincinnati and Dayton in a region commonly referred to as the I-75 growth corridor (see Map 1). Neighboring communities include: Deerfield Township to the northwest, south, and east; Union Township to the northeast; Turtle Creek Township to the north; and West Chester Township and Butler County to the west. Two interstate highways, I-75 and I-71, make Mason highly accessible to other communities in the region. I-71 traverses the eastern edge of the City. One full interchange is located at I-71 and Kings Mills Road. Interstate 75 is located approximately five miles west of the City and is accessible from Tylersville Rd.

U.S. 42 and S.R. 741 provide regional access to nearby communities such as Lebanon, Springboro, and Sharonville. Many regional and private recreational attractions are located in Mason. Paramount's Kings Island amusement park is perhaps the most notable. Others, such as the Golf Center at Kings Island Golf Course, The Beach Water Park, and the American Tennis Professionals Stadium are also located in Mason. Millions of people visit these recreational attractions each year.

### ***B. Development History***

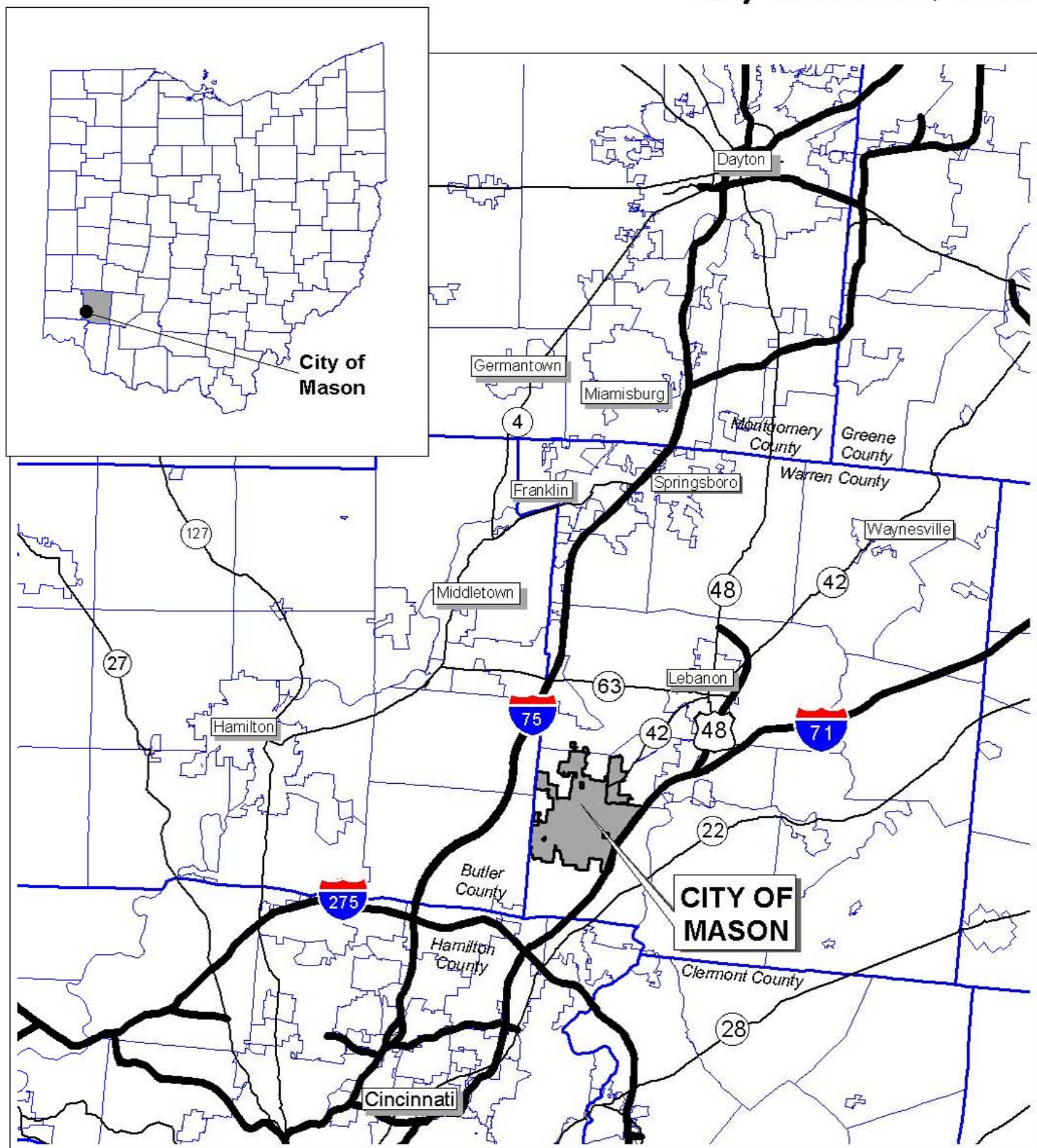
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In 1815, William Mason recorded a plat called Palmyra on land near the Little Muddy Creek. Mason sold 16 lots to pioneering businessmen and thus began the development of the City of Mason. The name Palmyra was rejected by the U.S. Post Office, and the town was subsequently renamed to Mason in 1835.

Mason was officially incorporated on March 22, 1840. Hotels and a general store, jewelry store, and bakery lined Mason's two-block downtown by 1843. Mason had 431 residents in 1850 according to the U.S. Census. Mason became a City in 1971 and continued to prosper throughout the Twentieth Century. The City's 2000 population is 22,016 according to the U.S. Census.

Population and economic growth continues in the Mason community, and growth is anticipated to continue into the foreseeable future. To accommodate this growth and demand for municipal services, additional land has been incorporated into the City of Mason. Mason spans approximately eighteen (18) square miles. Based on the 2000 Census, Mason is the fastest growing city in Warren County and one of the fastest growing cities in Ohio.

# City of Mason, Ohio



Basemap Source: ESRI, Inc.

## Map 1 - Regional Location

## C. User Analysis

To determine the likely users of Mason's bicycle and pedestrian path network, a thorough analysis and assessment of demographics and socio-economic characteristics has been conducted. The objective of this investigation was to identify Mason's population characteristics including age distributions, racial and ethnic backgrounds, families, income levels, occupational characteristics, and housing issues. Following the analysis of these factors, conclusions are formulated to help City officials determine community needs and establish goals and objectives to guide pedestrian and bicycle facility development.

Additionally, Mason's demographics were compared to trail user data taken from the 1999 *Little Miami Scenic Trail, Trail Users Study*. The *Trail Users Study* also provides national trail user data prepared by the National Park Service.

### Population Growth

According to the U.S. Census Bureau, the 2000 population of Mason is 22,016, an increase of 10,556 (or 92.11 %) from the 1990 U.S. Census of Population. As shown in Table 1, the City's population growth significantly outpaced that of Warren County and the State of Ohio as a whole.

**Table 1:**  
**Population 1980 - 2000**

| Governmental Unit | 1980       | 1990       | % Change<br>80-90 | 2000       | % Change<br>90-00 |
|-------------------|------------|------------|-------------------|------------|-------------------|
| Mason             | 8,711      | 11,460     | 31.56             | 22,016     | 92.11             |
| Warren County     | 99,276     | 113,909    | 14.74             | 158,383    | 39.04             |
| Ohio              | 10,797,630 | 10,847,115 | 0.46              | 11,353,140 | 4.67              |

**Source:** U.S. Census; Claritas<sup>1</sup>

This continual upward population trend is projected to continue. According to Claritas, the City's population is projected to grow to 25,562 by 2005. This unprecedented population growth is attributed to Mason's high quality of life. Representative of these attributes is an ideal location relative to the interstate highway system, safe neighborhoods, high quality housing stock, excellent public schools and city services, and a diverse employment base. In addition, and as mentioned above, Mason is home to premier regional recreation attractions, such as Paramount's Kings Island.

<sup>1</sup>Claritas specializes in custom demographic reports that include current year demographic and population estimates and projections. Planners use this data to analyze trends and to plan for future development.

## ***Housing Unit Growth and Occupancy***

There were 4,269 housing units in Mason in 1990. Of those, 1,056 (or 25.3%) dwelling units were renter occupied. This number may be low given the number of new multiple-family units that have been constructed on Mason-Montgomery Road and elsewhere subsequent to 1990. Multiple-family housing typically contains higher densities than detached single-family neighborhoods. On-site bicycle paths and sidewalks should be provided on multiple-family and single-family developments that connect to the City's bicycle and pedestrian path system.

***Table 2:  
Housing Units and Occupancy***

| <b>Dwelling Units</b>  | <b>Number</b> | <b>Percent</b> |
|------------------------|---------------|----------------|
| Owner Occupied         | 3,113         | 74.7%          |
| Renter Occupied        | 1,056         | 25.3%          |
| Total Occupied Housing | 4,169         | 100%           |

*Source: 1990 U.S. Census & Claritas*

As the population density of an area increases, the need for adequate services and facilities increases. The same is true for bicycle and pedestrian facilities. Paths are needed to provide bicyclists and pedestrians with safe and efficient transportation alternatives.

## ***Age, Sex and Race***

The type, design, and location of pedestrian and bicycle facilities depend, in part, upon the age structure of the population. The following table breaks down the various age groups using data from the 1990 Census and current year estimates by Claritas.

To illustrate changing demographics, the 1990 age distribution data is compared with 2000 estimates. Results from the 1990 and 2000 age bracket comparisons are used for discussion only and are not shown in Table 3. Table 3 also compares the City's age group characteristics with Warren County figures.

The largest numerical increase in population occurred in the 40-to-59 age bracket, an increase of 2,018 persons (or 131.66%) over a ten (10) year period. The largest percent increase occurred in the 50-to-59 age bracket, which grew by 1,537 new members (or 153.54%). Combined, the 65 years old and older age brackets grew significantly by or 2,187 people (or 122.3%) since 1990. Mason residents have a median age of 33.34 years, which is slightly younger than the median age of Warren County residents. Nationally and regionally, the population of most communities are becoming older as the baby boom generation matures and health care technology advances.

All age groups will benefit equally from a well-designed bicycle and pedestrian path system. However, the needs of each age group must be understood. Children and parents of children need safe bicycle facilities separated from motor vehicle traffic lanes on low volume, low speed residential streets that connect to schools and parks. Adults in the work force need bicycle and pedestrian facilities that provide direct access to employment and shopping centers. Seniors need direct access to parks, neighborhood commercial centers, and professional offices.

Combined, the “school age” children and “labor force” adults (between 25-to-59 years old) account for 70.5 percent of Mason’s population. Sidewalks and bicycle facilities are needed to connect Mason’s neighborhoods and families to parks and schools.

**Table 3:**  
**Age Distribution of Population - 2000**

| Group                       | Age           | Mason        |            | Warren County |            |
|-----------------------------|---------------|--------------|------------|---------------|------------|
|                             |               | Population   | Percentage | Population    | Percentage |
| Pre-School                  | Under 5 years | 1,551        | 7.49       | 11,147        | 7.09       |
| School Age                  | 5-9           | 1,626        | 7.70       | 11,478        | 7.30       |
|                             | 10-14         | 1,600        | 7.58       | 11,352        | 7.22       |
|                             | 15-17         | 942          | 4.46       | 6,777         | 4.31       |
| Labor Force/<br>College Age | 18-24         | 1,676        | 7.94       | 13,066        | 8.31       |
|                             | 25-29         | 1,286        | 6.09       | 10,471        | 6.66       |
|                             | 30-34         | 1,467        | 6.95       | 11,242        | 7.15       |
|                             | 35-39         | 1,848        | 8.75       | 13,500        | 8.30       |
|                             | 40-49         | 3,551        | 16.82      | 25,251        | 16.06      |
|                             | 50-59         | 2,537        | 12.02      | 19,308        | 12.28      |
|                             | 60-64         | 811          | 3.84       | 6,478         | 4.12       |
| Seniors/<br>Retirement Age  | 65-69         | 671          | 3.18       | 5,676         | 3.61       |
|                             | 70-74         | 614          | 2.91       | 4,670         | 2.97       |
|                             | 75-84         | 902          | 4.27       | 7,280         | 4.63       |
| <b>Median Age</b>           |               | <b>36.03</b> |            | <b>36.19</b>  |            |

*Source: Claritas*

A small but significant portion (2,187 people or 10.4%) of the population in 2000 is over 65 years old. This has significant implications in planning for the next 20 years. First, pedestrian paths, including intersection crossings, must be accessible and designed to accommodate those with mobility limitations. Seniors that cannot drive depend on safe and accessible pedestrian facilities.

Of the total population in 2000, 51.07 percent were female and 48.93 percent were male. This distribution is nearly equal and does not translate into any meaningful analysis.

Mason is predominately a Caucasian community of European descent, with little or no racial minorities. The City was 99 percent Caucasian in 1990 and 94.8 percent Caucasian in 2000.

## ***Mobility Limitations***

Approximately 1.4 percent of Mason's population between the ages of 16-to-64 years old have some type of mobility limitation (see Table 4). More than fourteen (14) percent of all seniors in the Mason community are challenged with some form of mobility limitation.

Although there are relatively few people with mobility limitations, other residents may face some form of temporary mobility limitation during their lifetime including: seniors, young children, pregnant women, individuals with broken bones, and individuals using support devices. Mobility limitations experienced by those under 16 years of age are not considered in Table 4. It is likely that some people younger than 16 years of age may also have mobility limitations.

Title II of the Americans with Disabilities Act (ADA), which took effect on January 26, 1992, prohibits discrimination, both intentional and unintentional, against individuals with disabilities in all facilities, activities, and services provided by public entities. It applies to all state and local governments, their departments and agencies, and any other agencies or special purpose districts of state or local governments.

***Table 4:  
Mobility Limitations By Age and Sex***

| <b><i>Age</i></b> | <b><i>Male</i></b> | <b><i>Female</i></b> | <b><i>Total</i></b> |
|-------------------|--------------------|----------------------|---------------------|
| <i>16 to 64</i>   | <i>46 (1.24%)</i>  | <i>61 (1.58%)</i>    | <i>107 (1.42%)</i>  |
| <i>65 +</i>       | <i>25 (5.19%)</i>  | <i>121 (24.1%)</i>   | <i>146 (14.84%)</i> |

***Source:*** 1990 U.S. Census Bureau

The implications of the ADA for Mason are significant. All existing sidewalks and other public pedestrian walkways should be brought into compliance with ADA requirements. All new sidewalks, trails, parking lots, pathways, and other recreational/pedestrian oriented facilities must be examined to determine if their design creates barriers that prevent use by all segments of the population.

## ***Income and Employment Status***

The estimated median household income for Mason residents in 2000 is approximately \$60,000, which is \$3,164 more than the \$56,836 median household income for Warren County. The estimated median household income in Mason increased by \$20,262 (or 50.99%) between 1989 and 2000. The 1989 income amounts are not adjusted for inflation. Table 5 shows the distribution of median household income levels for Mason and Warren County residents. Mason generally has slightly more residents with incomes over \$50,000 than the County. Conversely, the City has fewer residents with incomes less than \$24,999.

**Table 5:  
Median Household Income - 2000**

| <b>Income Range</b>     | <b>Mason</b> | <b>Warren County</b> |
|-------------------------|--------------|----------------------|
| Less than \$5,000       | 1.24%        | 1.99%                |
| \$5,000 to \$14,999     | 5.25%        | 6.44%                |
| \$15,000 to \$24,999    | 7.40%        | 9.22%                |
| \$25,000 to \$34,999    | 10.49%       | 10.46%               |
| \$35,000 to \$49,000    | 13.76%       | 15.07%               |
| \$50,000 to 74,999      | 29.65%       | 24.95%               |
| \$75,000 +              | 32.21%       | 31.88%               |
| Median Household Income | \$60,000     | \$56,836             |

*Source: Claritas*

The income and occupation data have important pedestrian and bicycling planning implications. Current income levels suggest that City residents may be able to afford and willing to support a City-sponsored bicycle and pedestrian network.

As indicated in Table 6, Mason's occupational force is similar to Warren County's. However, Mason has slightly more people employed in the "Executive and Managerial" and in "Administrative Support" professions, and fewer people employed in blue-collar professions, such as "Machine Operators" and "Precision Production."

In general, a majority of Mason's workforce is employed in jobs that are traditionally classified as "9-to-5" jobs. Executive, administrative, professional, technical, sales, and clerical occupations tend to operate from 9 a.m. to 5 p.m. While other occupations operate from 9 a.m. to 5 p.m., laborers and machine operators also work afternoon and evening shifts. With approximately 63 percent of the workforce occupied from 9 a.m. to 5 p.m., the opportunity to use bicycle and pedestrian paths will occur early in the morning, later in the evening, and on weekends. The workforce should be encouraged to walk or ride bicycles to work, when practical. Sidewalks, where missing, especially adjacent to busy thoroughfares, should be provided to encourage residents to walk to work.



**Table 6:  
Composition of Labor Force - 2000**

| <b>Occupation: Employed persons 16 years and over</b>  | <b>Mason</b> | <b>Percentage</b> | <b>Warren County</b> | <b>Percentage</b> |
|--------------------------------------------------------|--------------|-------------------|----------------------|-------------------|
| Executive, administrative, and managerial occupations  | 867          | 14.18             | 6,714                | 12.20             |
| Professional speciality occupation                     | 794          | 12.99             | 7,281                | 13.23             |
| Technicians and related support occupations            | 244          | 3.99              | 2,097                | 3.81              |
| Sales occupations                                      | 835          | 13.66             | 6,934                | 12.60             |
| Administrative support occupations, including clerical | 1,133        | 18.53             | 7,754                | 14.09             |
| Private household occupations                          | 11           | 0.18              | 149                  | 0.27              |
| Protective service occupations                         | 50           | 0.82              | 660                  | 1.20              |
| Service occupations, except protective and household   | 547          | 8.95              | 5,569                | 10.12             |
| Farming, forestry, and fishing occupations             | 66           | 1.08              | 1,073                | 1.95              |
| Precision production, craft, and repair occupations    | 634          | 10.37             | 6,753                | 12.27             |
| Machine operators, assemblers, and inspectors          | 507          | 8.29              | 5,723                | 10.40             |
| Transportation and material moving occupations         | 204          | 3.34              | 2,179                | 3.96              |
| Handlers, equipment cleaners, helpers, and laborers    | 221          | 3.62              | 2,146                | 3.90              |
| <b>Total</b>                                           | <b>6,113</b> |                   | <b>55,033</b>        |                   |

*Source: Claritas*

### ***Comparison to Regional and National Trail User Data***

The Ohio-Kentucky-Indiana Regional Council of Governments (OKI) prepared the *Little Miami Scenic Trail, Trail Users Study* in 1999. O-K-I surveyed numerous trail users. This survey included questions regarding sex, age, education, employment, etc. Selected characteristics of the Miami Trail and national trail users are compared to Mason's population in Table 7 below.

The national study data was produced by the National Park Service and the data is taken from the *Little Miami Scenic Trail, Trail Users Study*.

**Table 7:**  
***Mason's Population Compared to***  
***Regional and National Trail Users***

| Characteristic                   | Mason                         | Little Miami                  | National Study                |
|----------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Average Age                      | 36.0 <sup>1</sup>             | 46.5                          | 45.2                          |
| Percent White                    | 98.4%                         | 96%                           | 95%                           |
| Completed High School            | 83.83% <sup>2</sup>           | 99%                           | 98%                           |
| Completed Bachelor's             | 20.29% <sup>2</sup>           | 60%                           | 62%                           |
| Percent w/ Incomes over \$50,000 | 62%                           | 58%                           | --                            |
| Employment Classification        | White Collar/<br>Professional | White Collar/<br>Professional | White Collar/<br>Professional |

<sup>1</sup> Median Age available only, data provided by Claritas, 2000.

<sup>2</sup> Educational data taken from the 1990 U.S. Census.

**Source:** 1990 U.S. Census, Claritas, Trail User Study, Little Miami Trail

There are many similarities between Mason's population characteristics and people who typically use trails regionally and nationally. These similarities are significant because they indicate that there is a high propensity for Mason's population to use and support bicycle and pedestrian facilities. This indication is important from a public policy standpoint.

There are other assumptions that can be drawn from these similarities. Little Miami Trail users and trail users across the country are generally middle aged, white adults, employed in white-collar professions that provide sizable incomes.

According to the *Little Miami Scenic Trail, Trail Users Study*, people drive an average of twenty-three (23) miles to use the Little Miami Scenic Trail. An average visit lasts approximately three (3) hours. During this time, local vendors benefit. Little Miami Scenic Trail users are reported to spend an average of \$13.54 per person per visit. Broken down these purchases are as follows:

- \$3.43 per visit at restaurants;
- \$1.31 per visit at retail outlets on beverages or snacks;
- \$4.04 on auto related expenses such as gasoline and oil;
- \$1.91 on general retail purchases and bicycle gear and maintenance; and
- \$2.85 on other expenses and lodging.

It can be assumed that Mason's merchants and business owners will similarly benefit if a bicycle network is built. People from the region will use the City's bicycle and pedestrian network if it is well developed and designed. All users, citizen or not, will need food, beverages, and supplies. People that use the trails in conjunction with Mason's private recreation facilities may need overnight lodging.

### ***User Analysis Summary Conclusions***

1. Mason's population is expected to increase over the next several years. This growth is partly spurred by Mason's high quality of life, which could be threatened by vehicular congestion and pollution. A well-developed pedestrian network including bicycle paths should be developed as an alternative to the automobile.
2. All age groups will benefit from a well-designed bicycle and pedestrian transportation system. However, Mason's age distribution indicates that seventy (70) percent of Mason residents are in family age brackets. Thus, bicycle and pedestrian facilities should be designed first and foremost for children over the age of five (5) and adult riders in the labor force by providing facilities that connect to schools, parks, and commercial and employment centers.
3. Mason's residents are primarily employed in "white-collar" professions, which are generally "9-to-5" jobs. Opportunity exists for many residents to walk or ride bicycles back and forth from work during daylight hours.
4. Mason's professional workforce has higher than average incomes, which indicates the ability to financially support a well-designed, city-wide pedestrian and bicycle path network.
5. A small but significant part of the population (especially the elderly) has a mobility limitation. The City needs to ensure all physical barriers are eliminated that prevent accessibility to existing and future bicycle and pedestrian facilities.
6. The demographic profile of national trail users mirrors the demographic make-up of Mason; meaning, Mason residents should support and use bicycle and pedestrian paths.

### ***D. Physical Characteristics***

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Mason contains a variety of physical characteristics (e.g. floodplains, wetlands, soils, climate, and topography) that must be considered when planning for bicycle and pedestrian facilities. The 2001 Mason Comprehensive Plan has additional information regarding Mason's physical characteristics, including land use and other environmental features.

## ***Topography***

The topography in Mason is relatively flat. Elevations gradually decrease from 860 feet in the western portion of the City to 760 feet on the east side. This represents a 100-foot elevation change over a five (5) mile distance.

Drastic elevation change occurs east of the City in the Little Miami Scenic River Valley. The elevation drops 100 feet over a very short distance (about 1,000 feet). This represents a constraint to get to the Little Miami Scenic Trail. The average bicyclists will not be able to ride uphill out of the valley. It is also likely that children or the average adult bicyclists lacks the appropriate skill required to safely negotiate the steep and curved roads that lead to the Little Miami Scenic Trail.

## ***Soils***

The soil survey for Warren County shows two (2) major soil associations located in Mason. These 2 associations, Russell-Miamian-Xenia-Wynn and Fincastle-Brookston, comprise approximately ninety (90) percent of Mason's surface area. The Russell-Miamian-Xenia-Wynn association is the most abundant association found in Mason. It contains well drained and moderately well drained, nearly level to sloping soils on the Wisconsin-age glacial till plain. This soil association has few development limitations, but soil erosion can occur in areas with sharp relief.

The Fincastle-Brookston is the second largest soil association in Mason. It contains somewhat poorly drained and very poorly drained, nearly level of gently sloping soils in the Wisconsin-age glacial till plain. Erosion is not considered a problem with this series, but drainage is due to a seasonal high water table. Proper drainage may be required, particularly in depressions, to prevent standing water along or next to paths.

## ***Climate***

Mason's climate is suitable for walking and bicycling throughout most of the year. The average daily maximum temperature is 63.4° Fahrenheit and the average daily minimum temperature is 41.1° Fahrenheit. There are five (5) continuous months, May through September, that are outside of the freeze and frost period.

Summers are moderately warm and humid. Every year, there are an average of 25 days that exceed 89° Fahrenheit and 105 clear days (0 to 30% cloudiness). Snow fall averages 16.7 inches per year but varies from year to year.

## ***Floodplains***

A very small portion of the City lies within the one-hundred (100) year floodplain. Muddy Creek, a Little Miami Scenic River tributary, is the primary water feature in Mason. It is also the largest flood hazard area in the City, extending from the City's northeast boundary to the Warren and Butler County line. Other potential flood hazard areas in Mason are Pine Run, Davis Run, Muddy Creek Branch #2, Little Muddy Creek, and other unnamed tributaries.

Extra planning and engineering attention must be given to any project proposed within the one-hundred (100) year floodplain elevation to ensure that all legal and environmental compliance issues are satisfied. Since floodplain areas are environmentally sensitive, they should remain as open space for recreational uses. Bicycle and pedestrian way improvements are generally considered a "wise-use" in floodplains because they typically do not increase the magnitude of flooding downstream. Undeveloped floodplains typically contain woodlots, wetlands, and wildlife habitat. Bicycle and pedestrian paths in undeveloped floodplains would provide access to view and appreciate nature.

## ***Wetlands***

There are few wetlands in the City of Mason. A permit from the U.S. Army Corps of Engineers is required before any regulated wetland is drained and filled. Wetlands should not be a constraint to developing the Mason bicycle and pedestrian path network. Exceptions may occur where paths do not share or parallel existing road right-of-way.

## ***Natural Areas***

Natural areas that provide habitat for native flora and fauna are limited to isolated riparian corridors along portions of Muddy Creek, parks, and golf courses in the City. Quasi-natural areas include Western Row Golf Course, the Golf Center at Kings Island, Crooked Tree Golf Course, Quinn Park, Frank Hosea Woods, Corwin M. Nixon Park, Pine Hill Lakes Park, Meadows Park, and Heritage Oak Park. Bicycle and pedestrian facilities in these areas will give Mason's residents greater access to the remaining quasi-natural areas in the City.

## ***Physical Characteristics Summary Conclusions***

1. The soil survey for Warren County is general in nature, but it does provide a cursory review of the soil characteristics found in Mason. The soils appear suitable for bicycle and pedestrian facilities development, but ponding water and erosion can be a limiting factor to trail development in depressed areas and areas with sharp relief.
2. Floodplains or wetlands should not be a hindrance to designing and developing the bicycle and pedestrian network. Trail development in floodplains, if legally permissible, may encourage walking and bicycling as a means to enjoy and witness nature.

3. Mason's population can enjoy outdoor activity unhindered by freezing temperatures for at least (5) months out of the year. Avid walkers and bicyclists would benefit from paths throughout the year due to the relatively mild climate. Average yearly snowfall is not significant enough to close trails for any extensive length of time.
4. Mason's topographic conditions will not prevent bicycling within the City. However, the abrupt change in topography east of the City represents a physical constraint that must be overcome before a viable route to the Little Miami Scenic Trail can be provided.

### **III. INVENTORY OF EXISTING FACILITIES**

This section contains a comprehensive inventory and discussion of Mason's existing bicycle and pedestrian facilities. Bicycle paths at the regional level are also inventoried and discussed in this section. Facilities included in this inventory are graphically illustrated on Map 2 Bicycle and Pedestrian Facility Inventory and Map 3 Southwest Ohio Regional Trail Inventory.

#### ***A. Local Bicycle and Pedestrian Network***

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A City-wide sidewalk and bicycle facility inventory was undertaken in March 2001. The information shown on Map 2 Bicycle and Pedestrian Transportation Inventory, was compiled using aerial photographs. Map 2 was spot checked in the field for verification. The aerial photos were flown in 2000.

##### ***Sidewalks***

Pedestrian paths located adjacent to roads that are constructed of concrete and are three (3) to five (5) feet wide are classified as "Sidewalks" on Map 2. As shown on Map 2, one-half of Mason's streets contain sidewalks on at least one side of the street. A few residential subdivisions do not have sidewalks including:

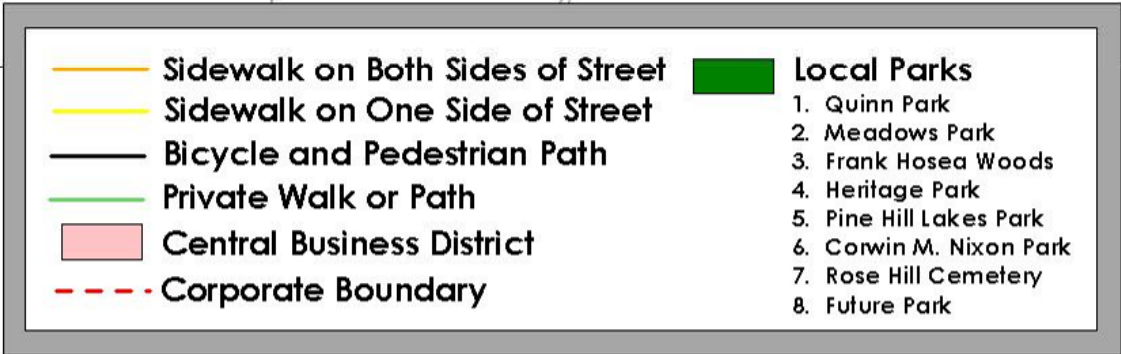
- < Elkwood (located on the north side of Kings Mill Road, east of Pine Hill Lakes Park);
- < Mason Heights (located on the south side of Kings Mills Road, west of Fairway Drive); and
- < Winding Creek and Manhasset (bound by Tylersville Road, Western Row Road, Mason Montgomery Road, and the I&O Railroad).

Sidewalks that are located on both sides of the street are designated as orange lines, and sidewalks that located on one side of the street are designated as yellow lines on Map 2. There are approximately twenty-one (21) miles of sidewalks located on one side of the street. Approximately thirty-three (33) miles of streets have sidewalks located on both sides of the street.

##### ***Bicycle and Pedestrian Paths***

Paths that are over five (5) feet wide, constructed of concrete or asphalt, and are physically separated from the road are designated as "bicycle and pedestrian paths." Bicycle and pedestrian paths are shown as black lines on Map 2. Some bicycle and pedestrian paths located in Pine Hill Lakes Park have a gravel surface. Bicycle and pedestrian paths accommodate multiple-uses including walking, jogging, bicycling, and skating. Of course, skating is limited to hard surface paths.





## Map 2 - Bicycle and Pedestrian Facility Inventory



There are numerous bicycle and pedestrian paths in Mason, particularly in City parks and new residential subdivisions. Most notable of these are the paths located in Heritage Park, Pine Hill Lakes Park, and Corwin M. Nixon Park. A bicycle and pedestrian path is also located adjacent to Snider Road between Mason Road and Tylersville Road. Other facilities are being built between U.S. 42 and I-71 on Tylersville Road and between Main Street and Tylersville Road on Mason-Montgomery Road. There are approximately nine (9) miles of bicycle and pedestrian paths in Mason.

### ***Private Paths***

Private walks and/or paths are generally located in residential subdivisions, golf courses, and industrial campuses. These facilities are not accessible to the general public. It may be advantageous for Mason's residents to have access to some or all of these facilities. Full access would require agreements between the City and other parties. Access easements, maintenance agreements, or purchasing the paths are a few options available to the City. Private paths are shown as green lines on Map 2. Map 2 shows the location of private paths in select subdivisions only.

## ***B. Regional Bicycle Path Network***\_\_\_\_\_

### ***Introduction***

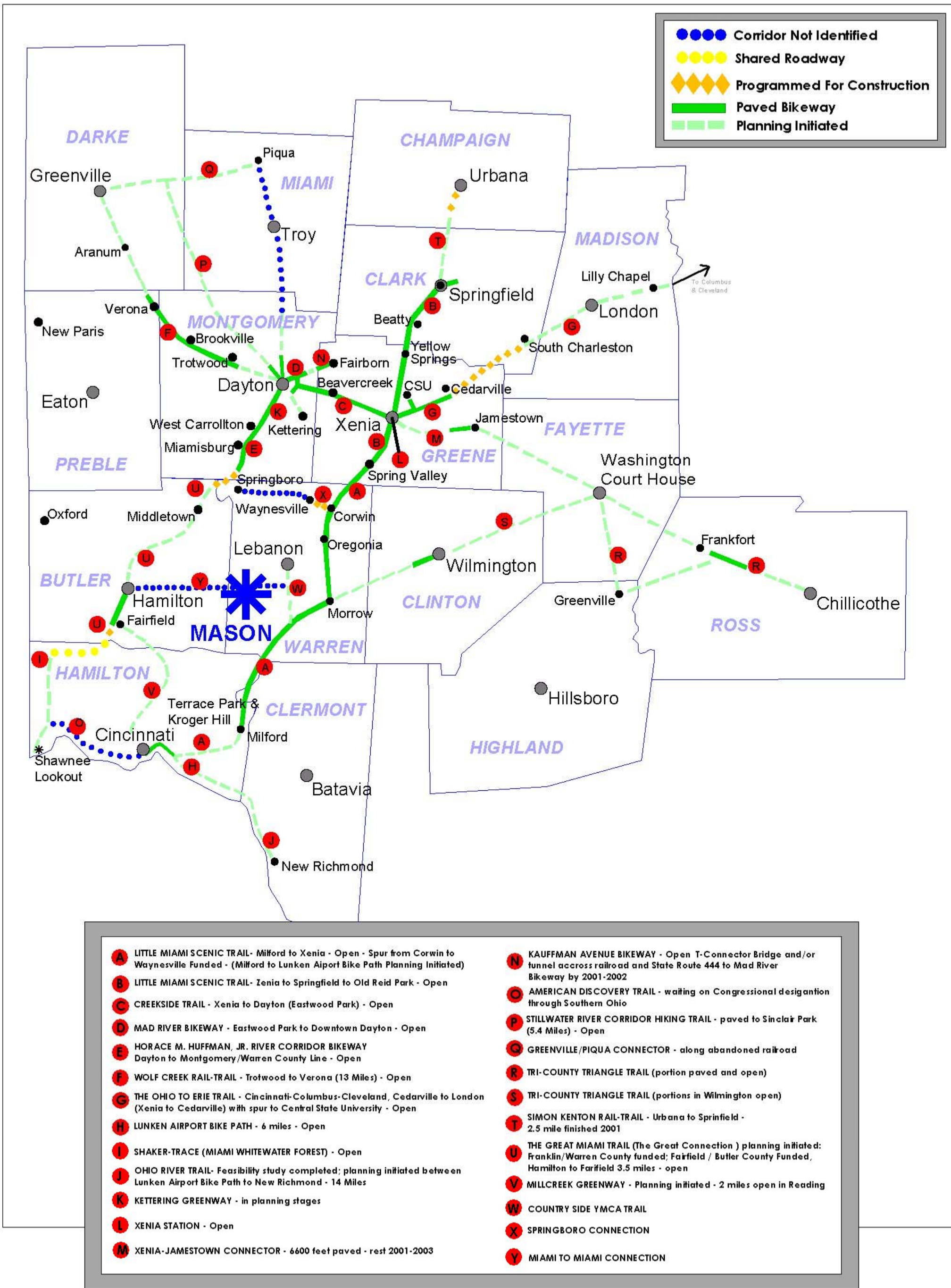
Southwest Ohio residents have access to a well-developed, non-motorized transportation system that includes approximately 150 miles of paved multi-use trails. The most immediate access to this network from Mason is the Little Miami Scenic Trail, which traverses Warren County. Greene County has the largest concentration of trails in Southwest Ohio, followed by Montgomery County.

Trails that are readily accessible to Mason residents (within a one-hour car ride) are discussed below. This general discussion includes trails located in sixteen (16) different counties in Southwest Ohio. Mason residents will have direct, non-motorized access to most of these trails once a viable connector from Mason to the Little Miami Scenic Trail is constructed. Connections to the Little Miami Scenic Trail from Mason are addressed in Section V Action Plan and Capital Improvement Schedule.

### ***Bicycle Paths***

The location of the regional trails described below are shown on Map 3. The letters found in parentheses following the name of each trail correspond to identification letters found on Map 3.

- **Little Miami Scenic Trail (A, B):** The Little Miami Trail is a 62.6 mile linear, multi-use path that starts in Springfield in Greene County and terminates near Milford in Clermont County. It traverses the entire extent of Warren County in a north-south direction along the Little Miami Scenic River.



Map 3 - Southwest Ohio Regional Trails

Fifty (50) miles of the trail is located in the Little Miami State Park and is operated by the State of Ohio. Forty-seven (47) miles of the trail within the Little Miami State Park is built on an abandoned railroad right-of-way. The paved portion of the trail is generally ten (10) feet wide and supports bidirectional travel. The remainder of the trail, north of the State Park, is operated by Greene County Parks and Recreation Department.

The trail provides access to an area rich in wildlife, scenic beauty, and history. This diversity includes mature forests, unique geologic features, song birds, and wild flowers. The Little Miami Scenic River meanders adjacent to the trail in Warren County providing other recreational opportunities such as canoeing, fishing, and camping. In addition, the trail provides access to Caesar Creek State Park, Fort Ancient State Memorial Park, Mathers Mill, and Spring Valley Wildlife Area. Paramount's Kings Island amusement park and The Beach Water Park, located in Mason, and Loveland Castle are also accessible from the Little Miami Trail.

Staging areas near Mason are located in Loveland, Morrow, and Corwin. At these locations, parking lots, restrooms, public phones, and trail access points are provided. The Little Miami Scenic Trail intersects three other trails in Xenia at an old rail freight yard called Xenia Station. Trail access is available at many other locations without amenities.

**Table 8 :**  
***Little Miami Trail Sections in Miles***

| <b>Section</b>          | <b>Length</b>     |
|-------------------------|-------------------|
| Milford to Loveland     | 8.5 miles         |
| Loveland to Morrow      | 13 miles          |
| Morrow to Oregonia      | 8.7 miles         |
| Oregonia to Corwin      | 6 miles           |
| Corwin to Spring Valley | 5.6 miles         |
| Spring Valley to Xenia  | 10.6 miles        |
| Xenia to Yellow Springs | 9.7 miles         |
| Springfield Connection  | 0.5 miles         |
| <b>Total</b>            | <b>62.6 miles</b> |

*Source: Ohio Department of Transportation*

As shown on Map 3, the Little Miami Scenic Trail is proposed to extend from its terminus at Milford south to Cincinnati. The trail will be over seventy (70) miles long when complete, and it will connect to the Lunken Airport Bike Path.

- **Creekside Trail (a.k.a. “H” Connector) (C):** The Creekside Trail runs 15 miles from Xenia Station to Eastwood Metropark in Dayton, where it connects to the Mad River Trail and the River Corridor Bikeway. This trail was originally called the “H” Connector because it runs east to west, connecting trails that run north to south. The trail is paved and is twelve (12) feet wide. It passes by many points of interest including the former town of Alpha, Kilkare Speedway, and Beaver Creek Banana (a wetland in Beaver Creek).
- **Mad River Trail (D):** This 2.8-mile trail provides a linkage between the River Corridor Bikeway in Montgomery County and the Creekside Trail, which leads to bicycle paths in Greene County.
- **Horace M. Huffman River Corridor Bikeway (E):** The River Corridor Bikeway is not a rail trail, but rather a multi-use path that traverses the majority of Montgomery County. It was dedicated in 1976 and named after Horace M. Huffman, president of the Huffman Corporation and founder of the Greater Dayton Bikeway Committee.

The Stillwater River Bikeway (7.5 miles) and the Mad River Bikeway (2.9 miles) are part of the River Corridor Bikeway system. Combined, the bikeway system contains over twenty-two (22) miles of paved trails that vary from eight (8) to twelve (12) feet wide. The bikeway begins at Sinclair Park, near Needmore Road, then follows the Stillwater River south where it crosses the Great Miami River. The bikeway continues south through downtown Dayton and terminates at Rice Field in Miamisburg.

The majority of the bikeway is located in the Great Miami River floodplain. There are a few exceptions, one being the use of surface streets (shared road right-of-way) between bikeway connecting points. Starting at Helena and McCook Roads, the path runs on both sides of the Great Miami River, where it converges back to one path at Washington Street in Dayton.

Many amenities are accessible via the bikeway. These amenities are: Sinclair Park, Island Metropark, Deeds Park, Eastwood Metropark, Wegerzyn Horticultural Center, Stillwater Gardens, Vietnam Veterans Park, Van Kleeve Metropark, Riversbend Park, Carrillon Historical Park, and Rice Field; Riverbend Art Center, Dayton Museum of Natural History, and Dayton Art Institute; and Sinclair Community College. The Bikeway also traverses the cities of Moraine and West Carrollton.

- **Wolf Creek Rail Trail (F):** The Wolf Creek Rail Trail is a thirteen (13) mile paved multi-use path that starts in Trotwood and terminates in Verona in northeastern Preble County. The trail passes by historic trail depots in Trotwood and Brookville. Both depots have been turned into museums.

- **Ohio to Erie Trail (Cedarville Trail) (G):** With a proposed opening date in 2003, the Ohio to Erie Trail will extend 325 miles providing a continuous path from Cincinnati to Columbus to Cleveland. A nine (9) mile portion of the planned Ohio to Erie Trail is open in Xenia. This twelve (12) foot wide paved section runs from Xenia Station to Cedarville. It is called the Cedarville Trail locally, and it connects to the Little Miami Scenic Trail at Xenia Station.
- **Lunken Airport Bike Path (H):** Six miles of the Lunken Airport Bike Path are open. Other regional paths are planned to connect to the Lunken Airport Bike Path, including the Little Miami Scenic Trail, Ohio River Trail, and Millcreek Greenway.
- **Shaker Trace (Miami Whitewater Forest) (I):** The Shaker Trace Trail is in the planning stages. When constructed, it will connect Whitewater Forest with Shawnee Lookout in southwest Hamilton County.
- **Ohio River Trail (J):** The Ohio River Trail is planned to extend sixteen (16) miles from Lunken Airport in Cincinnati to New Richmond. It will provide connections to the Little Miami Scenic Trail, Lunken Airport Bike Path, and the planned Cincinnati Riverfront East Trail. The trail will provide scenic views of the Ohio Valley as the trail meanders next to or through forests, parks, and wildlife preserves.
- **Kettering Greenway (K):** The City of Kettering's recreational path system is in the initial planning stages. Path routes and rights-of-way are identified, but project commencement or completion dates are not. When complete, the Kettering Greenway will connect to existing regional trails.
- **Xenia Station (L):** Xenia station is located in Xenia, Ohio on a former rail freight station. Most Trails in Greene County, including the Little Miami Scenic Trail, converge at this hub. From here, trails lead to Dayton, Springfield, Milford, and many other communities in Warren, Greene, Montgomery, and Clark counties. Future projects will link Xenia Station to Columbus and Cincinnati via the Ohio to Erie Trail and Washington Court House, and Chillicothe via the Xenia-Jamestown Connector and the Tri-County Triangle Trail.

Xenia Station is the focal point for biking activity in Greene County. This seven (7) acre complex has restrooms, parking, concessions, bicycle rental, bicycling classrooms, and rest area facilities.
- **Xenia-Jamestown Connector (M):** This is another trail that intersects Xenia Station and the Little Miami Scenic Trail. Though not open, this trail is planned to extend from Xenia to Washington Court House in Fayette County.

- **Kauffman Avenue Bikeway (N):** This bikeway is also known as the Huffman Prairie Overlook Trail. This trail runs from downtown Fairborne to U.S. 40. It is planned to connect to the Mad River Bikeway and River Corridor Bikeway in Dayton and the Creekside Trail. Amenities adjacent to the bikeway include Wright State University, Wright-Patterson Air Force Base, and the Wright Brothers Memorial.
- **American Discovery Trail (O):** The American Discovery Trail is in the early planning phase. It is proposed to follow the Ohio River and connect to the Shaker Trace Trail to the Lunken Airport Bike Path.
- **Stillwater River Corridor Hiking Trail (P):** Approximately five (5) miles of the trail is paved and open. The trail is planned to connect to the proposed Greenville/Piqua Connector.
- **Greenville/Piqua Connector (Q):** As the name implies, this trail will connect the cities of Greenville and Piqua along an abandoned rail line. The trail is currently in the planning stage.
- **Tri-County Triangle Trail (R):** This proposed trail will traverse Ross, Fayette, and Highland Counties. Approximately 6.75 miles are currently paved and many more miles are in the planning and acquisition stages. Construction will occur as funding becomes available. Project completion dates are not available.
- **Tri-County Greenway Trail (S):** The Tri-County Greenway Trail is in the early planning stages. Railroad right-of-way needs to be acquired. When constructed, it will connect the Little Miami Scenic Trail at Morrow to the Tri-County Triangle Trail at Washington Court House. A portion of the trail is open in Wilmington.
- **Simon Kenton Rail Trail (T):** The Simon Kenton Rail Trail is currently in the planning stage. It is proposed to connect Clark and Champaign Counties via a route between Springfield and Urbana. Approximately two (2) miles are programmed for construction.
- **The Great Connection (U):** The Great Connection is a planned, twenty-eight (28) mile paved, multi-use pathway starting at the Montgomery/Warren County line and ending at Fairfield. A 3.5-mile segment between Hamilton and Fairfield is open. Once constructed, this pathway will connect the Miami Whitewater Forest Trail in western Hamilton County to the River Corridor Bikeway in Montgomery County.

The trail will traverse through the cities of Franklin, Middletown, and Hamilton. The segment planned through Franklin has been funded. Points of interest along the way include: Franklin's historic post office, Middletown's historic districts, Bicentennial Park, the former Americana Amusement Park, Rentschler Forest Preserve, and the Soldiers and Sailors Monument in downtown Hamilton.



- **Millcreek Greenway (V):** Two miles of trails are open in Reading. The proposed greenway will start in Fairfield and terminate in Cincinnati at Lunken Airport Bike Path.
- **Countryside YMCA Trail (W):** The Countryside YMCA Trail will connect the City of Lebanon to the Little Miami Scenic Trail via an abandoned rail bed located south of Lebanon. A truss spans the Little Miami Scenic River giving access to the trail. The proposed asphalt trail is 7.9 miles long and ten (10) feet wide. Construction is anticipated to start in 2002 or 2003.
- **Springboro Bikeway Connection (X):** This bikeway is in the initial planning stage. The identified route follows Lower Springboro Road to U.S. 42 where it turns north to link with the Waynesville connector.
- **Miami-2-Miami Connector (Y):** The Miami-2-Miami Connector is a trail system proposed by the Butler-Warren Bicycle Coalition to link the Little Miami Scenic Trail in Warren County to the proposed Great Miami Trail in Butler County. The Butler-Warren Bicycle Coalition consist of a collaboration of several local governments including the City of Mason.

Three separate routes have been identified for further study. One proposed route traverses Middletown and West Chester Township to Mason where the path follows Bethany Road, US 42, and Mason-Morrow-Milgrove Road to the Countryside YMCA Trail.

The second proposed path connects to the Tylersville Road Bicycle and Pedestrian Path in Mason to Western Row Road to Kings Island Drive to Mason-Morrow-Milgrove Road to the Countryside YMCA Trail. The third proposed path enters Warren County at Irwin-Simpson Road, where it jogs over to Innovation Way to Western Row Road to Kings Island Drive to Mason-Morrow-Milgrove Road to the Countryside YMCA Trail.

These proposed paths include approximately thirteen (13) miles of existing trails and fifty-three (53) miles of proposed trails, but the proposed routes may change to reflect the recommendations made in the forthcoming Ohio-Kentucky-Indiana Regional Council of Governments (OKI) funded feasibility study. The feasibility study may take up to 2 years to complete.

## IV. BICYCLE AND PEDESTRIAN PATH SELECTION PROCESS

### A. *Introduction*

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This section outlines the planning process used to identify bicycle and pedestrian routes and special roadway treatments to accommodate Mason's residents. This process is loosely based on the U.S. Department of Transportation's model for planning bicycle facilities for children and the casual adult bicyclists as described in "*Selecting Roadway Design Treatments to Accommodate Bicycles*."

Five steps were used in the planning process to select bicycle facility locations (routes) and to select appropriate bicycle facility design types. These steps in sequential order are:

1. Identify Mason's most likely bicycle user groups;
2. Identify desirable bicycle and pedestrian routes;
3. Evaluate existing road conditions along the desired routes;
4. Identify common bicycle and pedestrian facilities; and
5. Select the appropriate bicycle and pedestrian facility to accommodate likely user groups.

The 5 step selection process is discussed in greater detail in the following paragraphs.

### B. *Identify Bicycle and Pedestrian User Groups*

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To plan adequately for future bicycle and pedestrian facilities, it is necessary to identify the likely user groups that will use and benefit from non-motorized transportation facilities the most. There are 3 generally accepted bicycle user groups. Each group, A, B, or C, is differentiated based on age and skill. Pedestrian use is restricted to multi-use bicycle and pedestrian paths and sidewalks. The needs and characteristics of pedestrians are also discussed.

#### ***Bicycle User Groups***

- **Group A (Advanced Bicyclists):** Group A bicyclists are experienced adult riders who can operate a bicycle in most traffic and road conditions. Bicyclists in this category prefer:
  - < Direct access to streets and highways to get to intended destinations;
  - < To operate at high speed with few delays; and
  - < Ample space on the roadway or shoulder to prevent bicyclists or motor vehicle operators from having to change position in the roadway when passing.



- **Group B (Basic Bicyclists):** Group B bicyclists include casual adult and teenage riders who are less able or confident to operate a bicycle in all traffic conditions. Group B bicyclists prefer:
  - < Direct access to destinations using low-speed, low-volume streets or facilities separate from roads; and
  - < Bicycle facilities that are well defined and distinguishable from motor vehicle lanes, especially on busy collector and arterial streets, or separate bicycle facilities.
- **Group C (Children):** Group C bicyclists include children up to the pre-teen years who are typically supervised when operating a bicycle in traffic and public streets. Parents of Group C riders prefer:
  - < Separate facilities next to busy arterial and collector roads; and
  - < Safe access to schools, parks, and other neighborhoods on low-speed, low-traffic roads.

## ***Pedestrians***

Pedestrians have unique needs and characteristics compared to bicyclists. The average walker moves at an average speed of 4.5 feet per second, which is much slower than the average speed of bicyclists and skaters. This speed differential can cause accidents when pedestrians and bicyclists share the same facility. The reason for this is simple; pedestrians, moving at slow speeds, can change direction or stop abruptly whereas bicyclists, moving at faster speeds, cannot.

Furthermore, just as the casual bicyclists may not feel comfortable sharing the road with fast moving motor vehicles, slower, less capable pedestrians may not feel safe sharing a path with bicyclists. As such, sidewalks should be provided on the opposite side of the road where bicycle paths are provided.

## ***C. Identify Desirable Bicycle and Pedestrian Routes*** \_\_\_\_\_

The second step in this process is to identify bicycle and pedestrian routes that meet the goals and objectives of this plan. In this case, proposed bicycle routes must: be safe for all users but particularly children and the casual adult rider; be accessible from each neighborhood; provide access to important destinations such as parks and schools; and provide continuity in Mason's bicycle and pedestrian network. Facilities that do not meet these criteria shall be given lower priority status for implementation. More detail regarding route selection criteria follows:

### ***Characteristics of Desirable Routes***

- **Accessibility:** To encourage bicycling and walking, bicycle and pedestrian facilities should be accessible from each neighborhood. To be accessible, bicycle facilities should be located within a half-mile from each residence in Mason.

The path or route from each residence to the closest bicycle facility should also be free from physical and psychological barriers such as wide, heavily traveled streets. Sidewalks should be accessible directly in front of each residence on at least one side of the street.

- **Linkage/Destination:** Each bicycle facility shall provide a linkage to important destinations in the Mason community such as parks, open spaces, schools, civic buildings, and other areas of community importance. Mason's sidewalk system must be continuous, meaning that each sidewalk must link or connect to another sidewalk without any gaps or breaks.
- **Continuity:** Each leg of the bicycle and sidewalk network shall be necessary to fill in a gap, which would otherwise leave a portion of the City unserved or inaccessible.
- **Directness:** Bicycle and pedestrian facilities, like roads, should provide the most direct route possible between two points. Bicycle and pedestrian trips generally decline when routes are out of the way and circuitous. This may not be the case for recreational bicycling or walking where the quality of the trip may be more important.
- **Safety:** To ensure the continued use and enjoyment of bicycle facilities, each facility must be safe for Group B/C riders to use.

#### ***D. Evaluate Existing Road Conditions*** \_\_\_\_\_

The third step is to evaluate the existing road conditions, primarily the right-of-way, to identify opportunities and constraints that may hinder or support the development of the bicycle facility chosen along a particular corridor. The road conditions taken into account include traffic volumes, speed limits, curb cuts, on-street parking, and roadway design.

Existing streets and roads are chosen over other corridors to serve as bicycle and pedestrian routes because they already provide mobility and accessibility to places that people want to go.

#### ***E. Identify Common Bicycle and Pedestrian Facility Designs*** \_\_\_\_\_

The fourth step in this process is to identify and describe bicycle and pedestrian facilities that are commonly used and found in Midwestern cities and across the United States. This step is crucial to ensure that Mason's leaders and decision makers are confident in the design recommendations made in this plan. In addition, the bicycle facilities proposed in this plan comply with or are based on the 1999 *Guide for the Development of Bicycle Facilities*, published by the American Association of State Highway Transportation Officials (AASHTO).

Three classes of bicycle facility designs are considered in this plan. These facilities include (1) bicycle and pedestrian paths, (2) bicycle lanes, and (3) bicycle routes.

## ***Bicycle Facilities***

- **Bicycle and Pedestrian Paths:** Bicycle paths are defined by AASHTO as:

*A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way.*

Pedestrians, such as walkers, joggers and skaters, can also use bicycle paths. For this reason, bicycle paths are called “Bicycle and Pedestrian Paths” in this plan. Bicycle and pedestrian paths:

- < normally accommodate two (2) directions of travel;
- < should be at least ten (10) feet wide;
- < should be at least twelve (12) feet wide where use is heavy;
- < have diminished usage due to excess of motor vehicle ingress and egress points; and
- < benefit children and casual riders the most.

- **Bicycle Lanes:** Bicycle lanes are defined by AASHTO as:

*A portion of the roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.*

Bicycle lanes exhibit the following characteristics:

- < typically carry one-way traffic in the same direction as adjacent motor vehicle traffic;
- < are typically between four (4) to five (5) feet wide;
- < provide highly visible lines that demarcate and segregate motor vehicle and bicycle transportation;
- < provide sense of security for casual riders and children (Group B/C riders); and
- < require regular sweeping and painting.

- **Bicycle Routes (Signed Shared Roadway):** Bicycle routes are designated by directional signage on existing roads. Bicycle routes (signed shared roadway) are found on streets and highways with no special treatment for bicyclists except for signage. Signage designates the roadway as a bicycle route and alerts motorists to be aware of bicyclists. Three types of signed shared roadway facilities are considered in this report. They are:

- < **Shared Lanes:** Bicyclists must share the road right-of-way (or road lane) with motorists. Shared lanes:
  - are located on low-volume, low-speed streets;
  - are typically twelve (12) feet wide;
  - have small or nonexistent shoulders; and
  - require cars to pass bicyclists by going left of center.
- < **Wide Curb Lanes:** Wide curb lanes are located adjacent to the curb and are wider than twelve (12) feet to accommodate both bicyclists and motorist on the same road. Fourteen (14) feet is usually considered wide enough to allow bicyclists and motorists to share the same lane without coming into conflict. Wide curb lanes:
  - are favored by advance riders (Group A);
  - accommodate both cars and bicycles without reducing the roadway capacity; and
  - tend to minimize real and perceived bicycle and vehicular conflicts.
- < **Shoulders:** AASHTO defines shoulders as:

*...The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of the subbase, base and surface courses.*

Shoulders are generally not designed for bicycle use, but improving shoulders is often the best way to accommodate bicyclists. This is especially true where roads do not have curb and gutter. Shoulders:

- should be paved and at least four (4) feet wide when designed to accommodate bicyclists; and
- may need to be wider due to higher-traffic volumes.

## ***Pedestrian Facilities***

Facilities generally used for the exclusive use of pedestrians include sidewalks and walkways. Both are exterior routes that are physically separated from the road and are designed to provide pedestrians with mobility and accessibility. Walkways are general pedestrian facilities including plazas, courts, and promenades. Sidewalks are pedestrian facilities that parallel a vehicular roadway.

**Sidewalks:** The number of pedestrians that are killed or injured each year underscores the need for sidewalks. Missing sidewalks discourages walking because pedestrians are forced to walk on the side of the road. The space between the sidewalk and the road acts as a real and psychological barrier that separates automobiles from the pedestrian realm. The farther the sidewalk is set back, the safer sidewalks feel and probably are. Barriers, such as curbs, green space or streetscape elements, also demarcate pedestrian and vehicular facilities.

## ***F. Selecting the Appropriate Bicycle and Pedestrian Facility*** \_\_\_\_\_

### ***Bicycle Facilities***

The last step is to select the appropriate facility (i.e. bicycle and pedestrian path, bicycle lane, or bicycle routes) to accommodate Group B/C riders for each bicycle route proposed in this plan. The Bicycle Federation of America estimates that approximately ninety-five (95) percent of the 100 million bicyclists in America are Group B or C riders. The conclusions drawn in the User Analysis support the above statistic and indicate that the vast majority of Mason residents are Group B/C riders.

***Table 9:  
Facility Selection Criteria for Group B/C Users***

| <b>Road Condition</b>  | <b>Bicycle Paths</b>                                                 | <b>Bicycle Lanes</b>                                                                                                     | <b>Shared Roadway</b>                                   |
|------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Traffic Volume per Day | Medium to High<br>(5,000 to 20,000+ trips)                           | Medium to High<br>(5,000 to 20,000+ trips)                                                                               | Low (less than 5,000 trips)                             |
| Speed Limit            | 35 to 45 m.p.h.                                                      | 30 to 45 m.p.h                                                                                                           | 30 m.p.h. or less                                       |
| Street type            | Arterial & Collector Roads                                           | Arterial & Collector Roads                                                                                               | Residential, Minor Collector Roads                      |
| R-O-W/Lane Width       | R-O-w needs to be wide enough to accommodate 10' wide separate path. | Lane width must accommodate 4' to 5' wide designated bike lane; r-o-w must be taken where lane width is not appropriate. | 12' lane required<br>14' lane required (wide curb lane) |
| Mixture of Traffic     | Heavy truck & automobile traffic                                     | Light commercial truck traffic intermixed with heavy automobile traffic                                                  | Mainly residential                                      |
| Curb Cuts              | Best with few curb cuts                                              | Use where there are numerous curb cuts                                                                                   | Residential curb or drive cuts only                     |

Road conditions, such as traffic volumes, speed limits, street type, right-of-way, paved lane width, and the number of curb cuts, are the criteria by which the appropriate bicycle facility design is selected. As shown in Table 9, bicycle facilities proposed on roads that exhibit high-traffic volumes and higher speeds should be designed as bicycle and pedestrian paths and bicycle lanes. Roads that exhibit low-traffic volume and slow speeds are appropriate as bicycle routes (signed shared roadway).

Bicycle paths and lanes have the same roadway condition criteria except for the number of curb cuts. Bicycle paths are not appropriate adjacent to roads that have numerous curb cuts. Bicyclists on bicycle paths traverse drive throats at a distance farther back from the road than most motorists are accustomed to stop and look for oncoming traffic. The same is true when motorists enter a drive from the street.

This situation can increase the risk of accidents and vehicular conflicts. Efficiency and enjoyment also decreases when bicyclists are required to stop at every curb cut. Stopping every forty (40) to sixty (60) feet is monotonous and decreases mobility.

### ***Pedestrian Facilities***

Mason has a well-developed sidewalk system; however, it is not comprehensive or continuous. Several streets and roads, chiefly in residential areas, do not have sidewalks. New facilities are recommended where they currently do not exist. Ultimately, each street in the City should have at least one sidewalk, especially on arterial and collector roads, so that pedestrians can walk anywhere in the City without having to walk on the road.

### ***Summary***

1. The majority of Mason's population falls into the categories of Group B/C riders. Thus, new facilities shall be designed with Mason's children and the casual adult rider in mind. In addition, bicycle facilities designed for Group B/C riders can be used by all age groups and groups with different skill levels.
2. Proposed routes shall be accessible from each neighborhood; provide linkages to important destinations such as parks and schools; and provide continuity and connectivity in Mason's bicycle network.
3. Street conditions dictate selection of the appropriate design facility to best accommodate Mason's families. Preferred bicycle facilities for Group B/C users are bicycle paths and bicycle lanes on busy roads and bicycle routes (signed shared roadway) on residential streets. Bicycle paths and bicycle lanes are not practical or needed in every situation because of physical limitations, cost, or traffic/road conditions.

4. Sidewalks will be recommended where they do not exist to fill in gaps located in Mason's sidewalk system to provide a more comprehensive and continuous system. Arterial and collector roads without sidewalks will receive high priority.

## V. ACTION PLAN AND CAPITAL IMPROVEMENT SCHEDULE

### A. *Introduction*

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This section sets forth priorities and recommendations to construct new bicycle and pedestrian facilities. These recommendations were established as a result of nine (9) months of work involving meetings with the Steering Committee, City Staff, Planning Commission, and City Council. Within this section:

- New bicycle and pedestrian facilities are proposed and prioritized in order of importance to achieve the goals of this plan;
- Linkages to the Little Miami Scenic Trail are identified and prioritized; and
- Cost estimates of each proposed project are provided.

### B. *Mason Bicycle Facility Plan*

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The Bicycle Facility Plan is best characterized as an integrated system of bicycle paths, lanes, and bicycle routes (signed shared roadway) that provide safe and efficient bicycle transportation between Mason's neighborhoods to destinations with community and civic importance.

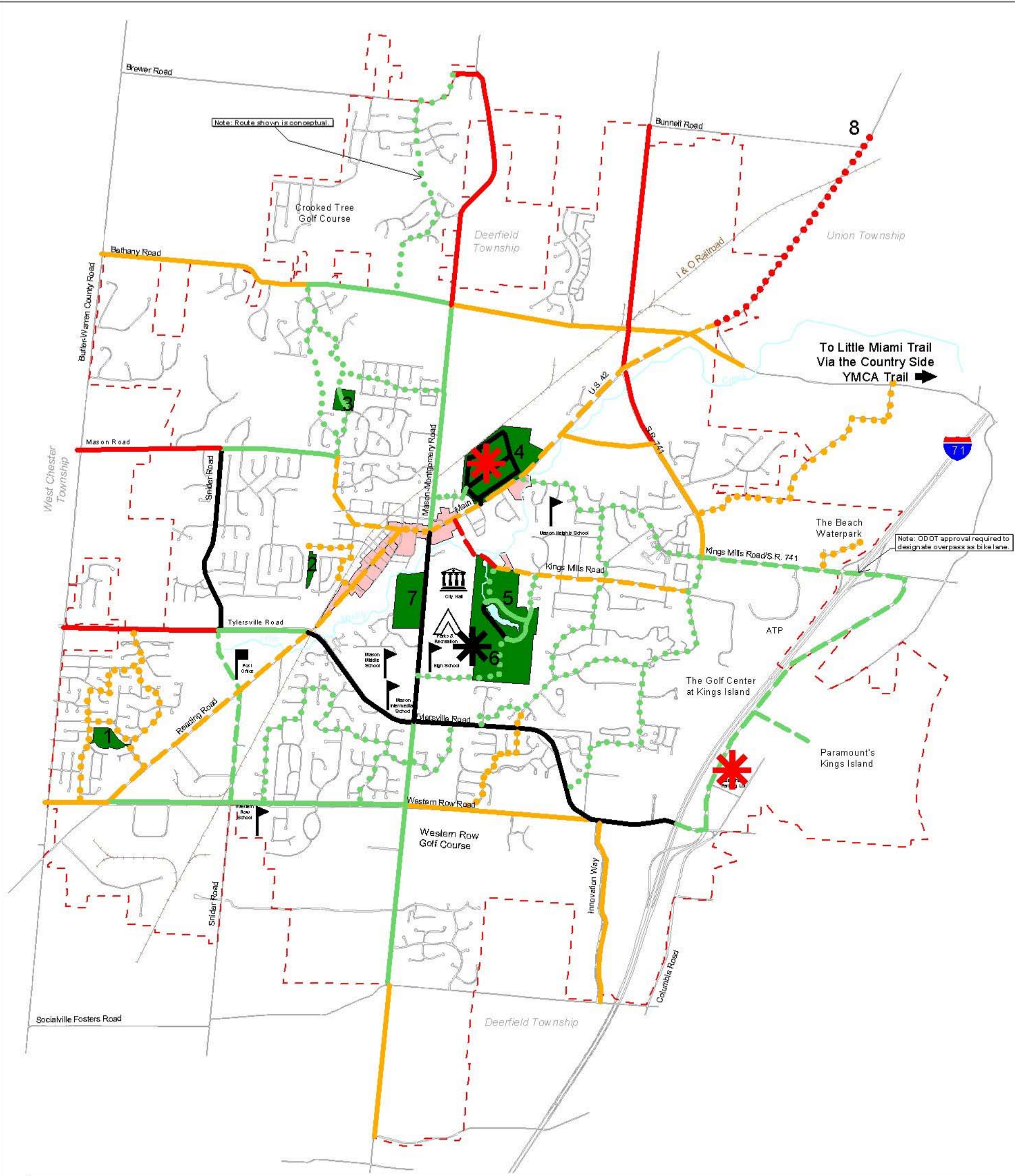
Bicycle facilities are planned in accordance with the street hierarchy whereby each neighborhood has access to a safe, shared roadway facility (i.e. bicycle route) on residential streets that lead to bicycle facilities (i.e. bicycle paths or lanes) on or adjacent to collector and arterial roads. Bicycle facilities on or next to arterial and collector roads lead to community oriented destinations including schools, parks, commercial centers, and businesses.

Map 4 graphically illustrates the bicycle facility recommendations made in this plan. The information and recommendations found on Map 4 are displayed through the use of colors and symbols. Colors, shown under the "Color Key" in the map legend represent existing bicycle facilities and project phases. Symbols shown under the "Facility Key" in the legend represent bicycle facility designs including "Bicycle and Pedestrian Paths", "Bicycle Lanes", and "Bicycle Routes". Common landmarks, such as schools, parks, and municipal buildings, are shown on the map for orientation purposes.

### *Bicycle Facility Phasing Plan*

- **Phase I:** Phase I bicycle facilities are shown as green lines on Map 4 and are planned to be constructed within one (1) to five (5) years. Phase I improvements must meet the goals and objectives of this plan, namely to link neighborhoods to parks and schools, or be an essential path segment needed to form a continuous and interconnected "loop trail" that circles the City.





Color Key (Phasing Plan)

- Existing Bicycle Facility
- Phase I Linkage (Within 5 years)
- Phase II Linkage (5 - 10 years)
- Phase III Linkage (10 plus years)

Facility Key

- Bicycle/Pedestrian Path
- Bicycle Lane
- Bicycle Route
- Central Trail Head

 Bike Trail Head

- Local Parks
- Quinn Park
  - Meadows Park
  - Frank Hosea Woods
  - Heritage Park
  - Pine Hill Lakes Park
  - Corwin M. Nixon Park
  - Rose Hill Cemetery
  - Future Park
- Central Business District
- Corporate Boundary

Map 4 - Bicycle Facility Plan

Base map Source: City of Mason, Ohio

Data Source: McKenna Associates, Inc. 2/2001



It is intended that Phase I facilities, especially the loop trail, be accessible from Mason's neighborhoods in the shortest amount of time as possible. Phase I facilities are seen as an immediate opportunity to provide access to high-quality and safe recreational bicycling. Phase I facilities also provide access to Corwin M. Nixon Park, Pine Hill Lakes Park, Heritage Park, Frank Hosea Woods, Municipal Building, Community Center, Mason High School, Mason Middle School, Mason Intermediate School, Mason Heights School, U.S. Post Office, The Beach Water Park, Paramount's Kings Island, and downtown.

Phase I accounts for more than twenty-five (25) miles of dedicated and continuous bicycle and pedestrian paths, bike lanes, and bicycle routes.

- **Phase II:** Phase II facilities are shown as orange lines on Map 4, and they are planned to be implemented between five (5) to ten (10) years. Facilities in this priority classification provide further accessibility to community facilities and connections to existing and proposed paths. Phase II improvements will provide access to Quinn Park, Meadows Park, and to commercial outlets along Reading Road.

Bethany Road is also planned to have Phase II improvements in anticipation of the Miami-2-Miami Connection being implemented. A Phase II bicycle lane is planned for the majority of U.S. 42. This bicycle lane will provide additional access to downtown. More than nineteen (19) miles of Phase II bicycle facilities are planned.

- **Phase III:** Proposed facilities that are not located adjacent to a neighborhood within Mason or do not provide a direct route to a community facility are given the lowest priority. Likewise, facilities that do not provide a needed connection to other bicycle facilities are prioritized in the Phase III designation. Phase III facilities are shown as red lines on Map 4.

It is anticipated that these facilities will be implemented after ten (10) years or more. All Phase III facilities are proposed on the City's perimeter where housing densities are the lowest. The status of Phase III facilities can change as new subdivisions or community facilities are developed in less populated areas. Approximately seven (7) miles of Phase III facilities are planned on Map 4.

### ***Bicycle and Pedestrian Facilities***

Road characteristics of each planned route were evaluated to determine what bicycle facility type best suits the needs of Group B/C riders. Please see Appendix A to review selected roadway characteristics.

- **Bicycle and Pedestrian Paths:** Bicycle and pedestrian paths are designated as solid lines on Map 4. Bicycle and pedestrian paths are planned to accommodate all modes of non-motorized transportation including walking, jogging, skating and bicycling.

This facility type is planned to be ten (10) feet to twelve (12) feet wide, constructed of concrete or asphalt, and support bidirectional travel. Bicycle and pedestrian paths are generally planned next to arterial and collector roads that exhibit high traffic volume and speeds. When this plan is fully implemented, Mason will have over nineteen (19) miles of bicycle and pedestrian paths.

- **Bicycle Lanes:** Bicycle lanes are shown as dashed lines on Map 4. Bicycle lanes are designed for the exclusive use of bicyclists. Motor vehicles and pedestrians are prohibited to use these facilities. Pavement markings and striping are used to demarcate these facilities and separate them from motor vehicle lanes. Bicycle lanes are generally planned next to arterial roads that exhibit high-traffic volume and speeds and where there are numerous drive or curb cut openings. More than eleven (11) miles of bicycle lanes are planned between all three (3) implementation phases.
- **Bicycle Routes (Signed Shared Roadway):** Bicycle routes are designated as dotted lines on Map 4. No special treatment is proposed for these facilities except for signage. Bicyclists must share the roadway with motor vehicles. Therefore, bicycle routes are proposed on low-traffic, low-speed limit roads. West Main Street is the exception. There is not enough lane width or road right-of-way in the downtown to make the necessary improvements for dedicated bicycle lanes. More than twenty (20) miles of bicycle routes are planned in the City.

### ***Planned Bicycle Trail Heads***

Trail heads are proposed at the Mason Community Center / Corwin M. Nixon Park, Pine Hills Lakes Park, Heritage Park, and the Ride Share Parking Lot located at Paramount's Kings Island. Vehicular parking was the main requirement for trail head selection. Other amenities, such as restrooms, concession stands, and water fountains were considered, but not necessary.

The Mason Community Center / Corwin M. Nixon Park is the proposed "Central Trail Head" because of its central location and its abundance of parking spaces and other amenities such as the concession stand at Lou Eves Municipal Pool. Table 10 contains a limited list of existing amenities located at each proposed trail head.

Parking is important to parents who do not have a direct route to a path from their residence. Even though it is a plan goal to have a bicycle facility accessible from each neighborhood, driving to a trail head may be more practical and preferred by some people. Also, bicyclists from around the region may drive to Mason to use the City's bicycle facilities.

**Table 10:  
Existing Trail Head Amenities**

| <b>Trail Head</b>         | <b>Parking</b>       | <b>Restrooms</b> | <b>Pavilion</b> | <b>Concession<br/>Stands</b> | <b>Play<br/>Structures</b> |
|---------------------------|----------------------|------------------|-----------------|------------------------------|----------------------------|
| Corwin M<br>Nixon Park    | 560 Spaces           | 1                | 1               | 1                            | 3                          |
| Pine Hill<br>Lakes Park   | 53 Spaces            | 1*               | --              | --                           | 3                          |
| Heritage Park             | 763 Spaces           | 1                | 1               | 1                            | 2                          |
| Ride-Share<br>Parking Lot | Over 1,000<br>Spaces | --               | --              | --                           | --                         |

\*The restroom at Pine Hill Lakes Park is open all year.

Concession stands have limited hours during the spring, summer, and fall seasons, but they will provide bicyclists with a needed refreshment or snack when open. Play structures, though not a bicycle oriented amenity, may be important to families. Most trail heads contain other recreation facilities including, but not limited to, soccer fields, playground equipment, baseball/softball diamonds, and basketball and tennis courts.

### ***Trail Head Recommendations***

Public restrooms need to be located throughout the bicycle path network. In addition to those restrooms identified in Table 10, restrooms should ideally be provided in parks not designated as trail heads including Quinn Park and Frank Hosea Woods. Likewise, pavilions should be accessible at each park to provide shelter during inclement weather. In summary, restrooms, pavilions, benches, and water fountains are needed at each trail head.

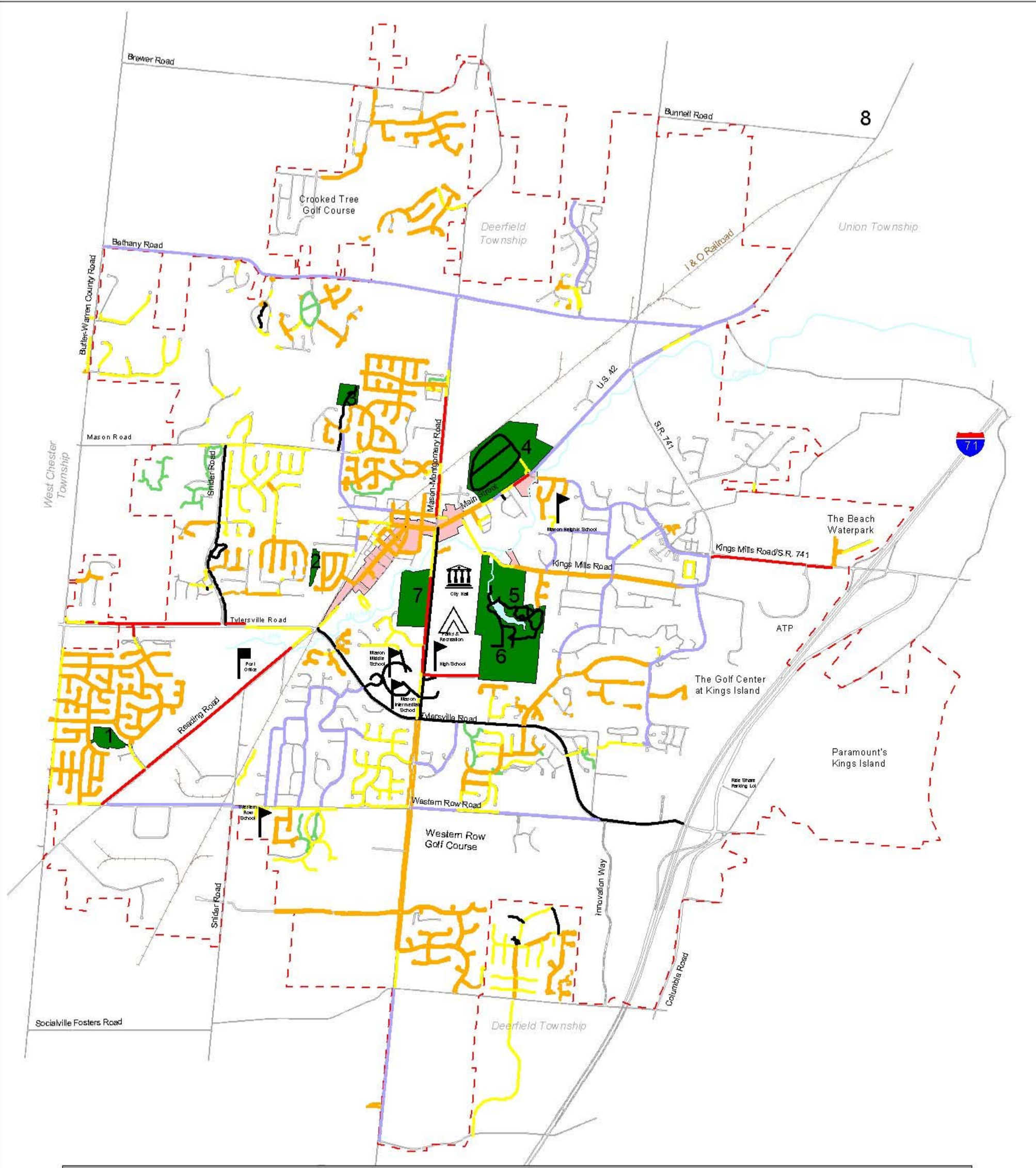
## ***C. Mason Sidewalk Plan***

The purpose of this section is to plan and prioritize new sidewalk construction to:

- increase pedestrian mobility, access, and safety;
- fill in the gaps between missing sidewalk segments along arterial roads and residential collector streets; and
- create a continuous and comprehensive sidewalk system.

Every arterial and collector street is planned to have a continuous sidewalk on at least one side of the street on Map 5. Originally, the goal was to provide at least one sidewalk on each street. However, this plan takes into account resident choice to reside in neighborhoods without sidewalks. As such, residential access roads that carry low-speed, low-volume traffic are not designated to have sidewalks.





Existing Pedestrian Facilities

Sidewalk on Both Sides of Street

Sidewalk on One Side of Street

Bicycle and Pedestrian Path

Private Walk or Path

Central Business District

Corporate Boundary

Sidewalk Connections

Phase I (0 - 5 years)

Phase II (5 plus years)

Local Parks

1. Quinn Park

2. Meadows Park

3. Frank Hosea Woods

4. Heritage Park

5. Pine Hill Lakes Park

6. Corwin M. Nixon Park

7. Rose Hill Cemetery

8. Future Park

Map 5 - Sidewalk Plan

Priority is given to collector and arterial roads that provide access to community facilities, employment areas and shopping centers. Residential collector or residential through streets that connect to arterial roads are planned to have sidewalks on at least one side of the street where they currently do not exist.

### ***Sidewalk Phasing Plan***

- **Phase I:** Arterial roads that provide access to employment, commerce, and community facilities and do not have sidewalks on at least one side of the road are classified as “Phase I” sidewalk connections or improvements on Map 5. Phase I sidewalk improvements are designated as red lines on Map 5, and they are located on:
  1. Mason-Montgomery Road, north and south of Main Street;
  2. Reading Road (U.S. 42), south of Tylersville Road;
  3. Tylersville Road, east and west of Snider Road; and
  4. East Main Street (U.S. 42) in front of Heritage Park.

Approximately 4.5 miles of Phase I sidewalks are planned to be constructed within a five (5) year period. These facilities, when constructed, will provide safe pedestrian access to downtown, retail centers adjacent to Kings Mills Road and U.S.42, Municipal Building and the Community Center. Sidewalks adjacent to arterial roads should be provided on both sides of the street, but not required according to the Federal Highway Administration’s *Planning Design and Maintenance of Pedestrian Facilities*.

- **Phase II:** Collector roads without sidewalks that link residential streets to arterial roads are classified as Phase II sidewalks (designated as purple lines) on Map 5. Examples include Parkside Drive, Fairway Drive, Cloverwood Drive/Acoma Drive and Mason Road.

Phase II sidewalks are also planned next to major and minor thoroughfares, such as Bethany Road and U.S. 42 east of Heritage Park, that do not provide a pedestrian linkage between neighborhoods and community facilities and/or employment and retail centers. It is anticipated that 16.7 miles of Phase II sidewalks will be constructed sometime after five (5) years.

### ***Sidewalk Plan in Relation to Bicycle Facility Plan***

In many instances, sidewalks and bicycle paths are planned in the same road right-of-way. Both facilities should be developed, but sidewalks should be constructed on the opposite side of the road from a bicycle path due to the differences in speed associated with both modes of transportation.

## **D. Capital Improvement Plan**

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### ***Introduction***

Cost estimates are provided for budgetary purposes and to help City officials set priorities concerning bicycle and pedestrian related improvements on an annual basis. Estimates shown in Table 11 include all planned bicycle and pedestrian improvements on a per facility, per phase, and total cost basis.

Cost estimates are calculated by multiplying the length of the planned improvement by a standardized per foot cost. Construction cost standards are based on recently constructed bicycle and sidewalk improvements in southwest Ohio. These estimates are not exact or specific to any improvement recommended in this plan. Exact costs will require detailed surveying and engineering work. All dollar amounts shown are based on 2001 construction costs.

### ***Improvements Included in the Cost Estimates***

- **Bicycle Paths:** Bicycle path construction is estimated to cost \$42 per foot for a ten (10) foot wide asphalt path. This estimate includes limited earthwork and drainage, pavement, and signage. It is assumed that all bicycle paths will be constructed in existing road right-of-way or on City-owned property. Thus, the estimate does not include right-of-way acquisition costs. The per foot cost could increase up to \$65 where substantial earthwork and drainage improvements are required.
- **Bicycle Lanes:** Bicycle lanes are estimated to cost \$30 per foot. This estimate is a weighted average of a high and low range of costs. At the low end, bicycle lanes are anticipated to cost \$10 per foot to construct. Improvements include pavement striping and pavement markers. At the high end, bicycle lanes are anticipated to cost approximately \$100 to construct. Improvements include lane widening, curb and gutter replacement, new drainage, striping, markings, and signs. Most planned bicycle lane facilities will not require road widening.
- **Bicycle Routes:** Bicycle routes are estimated to cost \$2 per foot. No improvements are required except for signage to designate the road as a bicycle route. Signs typically cost approximately \$125 per sign. Bicycle signs are generally located at each intersection and at mid-block intervals. Road improvements, such as lane widening, paving shoulders, and setting curb, will increase costs substantially.

**Table 11**  
**Capital Improvement Schedule**

| Phase                   | Length (Miles) | Cost per Unit of Distance <sup>1</sup> | Total Cost <sup>1</sup> |
|-------------------------|----------------|----------------------------------------|-------------------------|
| <b><u>Phase I</u></b>   |                |                                        |                         |
| Path                    | 7.21           | \$42/ft. <sup>2</sup>                  | \$1,598,890             |
| Lane                    | 4.63           | \$30/ft. <sup>3</sup>                  | \$733,392               |
| Route                   | 13.42          | \$2/ft. <sup>4</sup>                   | \$141,715               |
| Sidewalk                | 4.4            | \$15/ft. <sup>5</sup>                  | \$348,480               |
| Subtotal <sup>6,7</sup> | 25.26          |                                        | \$2,473,997             |
| <b><u>Phase II</u></b>  |                |                                        |                         |
| Path                    | 7.5            | \$42/ft. <sup>2</sup>                  | \$1,633,830             |
| Lane                    | 6.13           | \$30/ft. <sup>3</sup>                  | \$970,992               |
| Route                   | 5.84           | \$2/ft. <sup>4</sup>                   | \$61,670                |
| Sidewalk                | 16.67          | \$15/ft. <sup>5</sup>                  | \$1,320,264             |
| Subtotal <sup>6,7</sup> | 19.47          |                                        | \$2,696,492             |
| <b><u>Phase III</u></b> |                |                                        |                         |
| Path                    | 5.05           | \$42/ft. <sup>2</sup>                  | \$1,119,888             |
| Lane                    | 0.37           | \$30/ft. <sup>3</sup>                  | \$58,608                |
| Route                   | 1.41           | \$2/ft. <sup>4</sup>                   | \$14,890                |
| Subtotal <sup>6,7</sup> | 6.83           |                                        | \$1,193,386             |
| Total <sup>6,7</sup>    | 51.56          |                                        | \$6,363,875             |

<sup>1</sup> The amount shown is rounded to the nearest whole dollar and is based on 2001 construction costs.

<sup>2</sup> Costs include minimal earthwork and drainage, pavement and signage for a 10'-wide asphalt path.

<sup>3</sup> \$30 is an estimated average between a high range of \$100 per foot and a low range of \$10 per foot to construct bicycle lanes. The high end assumes that lane widening is required and that curb and gutter must be moved. The low end estimate includes road stripping and markings only.

<sup>4</sup> Costs include signage only at intersections and at 1/4 mile mid-block intervals.

<sup>5</sup> Costs include material to construct a 5'-wide concrete walk.

<sup>6</sup> Total and subtotal amounts show the sum of all bicycle facility improvements, excluding sidewalk length and costs.

<sup>7</sup> Estimated costs include roadway widening/improvement projects and new development projects. The City will not incur all costs. Bicycle facilities will be provided in new developments according to this plan. Grants and other outside funding sources are also available.



- **Sidewalks:** It is estimated that a five (5) foot wide concrete walk will cost \$15 per foot to construct.

## ***Financing and Funding***

The total dollar amount to construct all three (3) phases is \$6,130,397. Financing options and funding sources are identified in Section VI Implementation Strategies. In addition, many of the proposed bicycle improvements will be constructed in conjunction with road widening improvements or with new development. Facilities constructed in conjunction with private development and road widening projects will substantially reduce the City's burden to pay for the proposed facilities.

## ***E. Little Miami Scenic Trail Connection*** \_\_\_\_\_

### ***Introduction***

The Little Miami Scenic Trail is located east of Mason and the Little Miami Scenic River. The Little Miami Scenic Trail is the only regional multiple-use trail in Warren County, and it is one of the most visited or used trails in Ohio. Due to the Trail's popularity and proximity to Mason, the City has placed high priority to plan and ultimately achieve a viable and safe connection to the Little Miami Scenic Trail from Mason.

The Steering Committee identified several routes to the Little Miami Scenic Trail from Mason. As such, this section identifies and describes each route to the Little Miami Scenic Trail that the Steering Committee considered. Characteristics of each route (each road segment of each route), such as traffic volumes, speed limits, road lane width, shoulders, and topography, are also described and shown on Map 6. At the end of this section, routes are recommended with the condition that the selected route is studied further and that any required safety-related improvements are made when the plan is implemented.

### ***Challenges***

Identifying a practical and safe route was in-and-of-itself a challenging endeavor due to the steep, narrow and winding roads that provide access to the Little Miami Scenic Trail through the Little Miami Scenic River valley. Route selection was limited to three (3) local bridges that cross the Little Miami Scenic River. Further, most road segments along each potential route need improvements to safely allow motor vehicles and bicyclists to share the road. Road improvements necessitate intergovernmental cooperation because each route is out of Mason's jurisdiction.

### ***River Crossings***

Three (3) local river crossings provide access to the Little Miami Scenic Trail from Mason. These crossings are located at Kings Mills Road, Fosters-Maineville Road, and at an abandoned railroad truss, which is part of the proposed Countryside YMCA Trail (see Map 6).

## Connection Routes

The Steering Committee reviewed road characteristics of each road segment that leads to one of the three river crossings. Road characteristics of each route were considered to identify the safest and most practical route for Group B/C bicyclists. Road characteristics taken into consideration include: traffic volumes, speed limits, lane width, slope, and other physical barriers. The routes considered as part of this evaluation are shown on Map 6. These routes are:

- **Countryside Y.M.C.A. Trail:** The proposed Countryside Y.M.C.A. Trail will, when complete, connect Lebanon to the Little Miami Scenic Trail. This connection is anticipated to be complete by the end of 2003. The trail segment located between Mason-Morrow-Millgrove Road and the Little Miami Scenic River consists of an abandoned railroad. The rails and ties have been removed, but the bed is still intact. The rail bed is flat. Possible routes from Mason to the Countryside Y.M.C.A. Trail include:
  - < Mason-Morrow-Millgrove Road: This route is shown as a green line on Map 6. The Countryside YMCA Trail is directly accessible from Mason-Morrow-Millgrove Road from either U.S. 42 or Cox-Smith Road. Mason-Morrow-Millgrove Road carries a large amount of commercial truck traffic even though daily traffic volumes are less than 5,000 vehicles a day. The lanes are approximately eleven (11) feet wide, and the shoulders are two (2) to four (4) foot wide east of Cox-Smith Road. A large hill is located east of Cox-Smith Road. This hill will be difficult for most casual bicyclists to ride up or down.

Mason-Morrow-Millgrove Road east of I-71 gradually inclines up to the Countryside YMCA Trail entrance. The road lanes are 11 feet wide with a very small paved shoulder (2 to 4 inches). Forty-five (45) miles per hour is the posted speed limit along the entire roadway, but some vehicles appear to be moving much faster.
  - < Cox-Smith Road to Mason-Morrow-Millgrove Road: This route is designated as a orange line on Map 6. This connection is relatively close to most Mason neighborhoods and it is generally direct. Cox-Smith Road has a low traffic count, and it is very narrow. Additionally, Cox-Smith Road has an abrupt change in elevation immediately before it terminates at Mason-Morrow-Millgrove Road. This sudden elevation change will make it difficult for less experienced bicyclists to stop at the intersection. Please see the previous paragraph to review the description of Mason-Morrow-Millgrove Road.



|                    |                                                                   |                                                                                   |
|--------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Speed Limit:       | 45 m.p.h.                                                         |  |
| Traffic Counts:    | Not available.                                                    |                                                                                   |
| Topography:        | Relatively flat between U.S. 42 and Cox Smith Rd.                 |                                                                                   |
| Lane Width:        | 11 to 11.5 ft.; no shoulder.                                      |                                                                                   |
| Physical Barriers: | Small bridge with 10-foot wide lane, plus 1.5-foot wide shoulder. |                                                                                   |
| Other:             | Considerable amount of truck traffic.                             |                                                                                   |

|                    |                                                                   |                                                                                     |
|--------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Speed Limit:       | 45 m.p.h.                                                         |  |
| Traffic Counts:    | 4,436 (Warren County, 1998).                                      |                                                                                     |
| Topography:        | Large hill east of Cox-Smith Rd.                                  |                                                                                     |
| Lane Width:        | 11 to 11.5 ft.; with 2 to 4-foot wide shoulder.                   |                                                                                     |
| Physical Barriers: | Hill may be too large and steep for most bicyclists to negotiate. |                                                                                     |
| Other:             | Considerable amount of truck traffic.                             |                                                                                     |

|                    |                                                                                                                                                                         |                                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Speed Limit:       | 25 m.p.h.                                                                                                                                                               |  |
| Traffic Counts:    | 595 (Warren County, 2,000).                                                                                                                                             |                                                                                   |
| Topography:        | Flat w/sudden elevation change before the Cox-Smith/Mason-Morrow-Millgrove Rd. intersection.                                                                            |                                                                                   |
| Lane Width:        | 8 ft.; no shoulder.                                                                                                                                                     |                                                                                   |
| Physical Barriers: | Road is narrow with many 90 degree turns. Unsafe descent at road terminus: Bicyclists may not be able to stop at the Cox-Smith/Mason-Morrow-Millgrove Rd. intersection. |                                                                                   |
| Other:             | Road primarily serves as a collector for low-density residential dwellings.                                                                                             |                                                                                   |

- + Abandoned rail bed (separate path).
- + Relatively flat w/slight elevation change (2% or less).
- + Safest route for Mason's families to cross the Little Miami Scenic River.
- Project completion is earmarked for 2003.

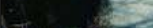
Speed Limit: 45 m.p.h.  
Traffic Counts: 6,171 (Warren County, 1999)  
Topography: Rolling terrain; one steep hill.  
Lane Width: 12 ft.; little, to no shoulder  
Physical Barriers: Steep hill will prevent most bicyclists from using this route.

|                    |                                                                                                             |                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Speed Limit:       | 40 m.p.h.                                                                                                   |  |
| Traffic Counts:    | 9,950 (Warren County, 1999).                                                                                |                                                                                     |
| Topography:        | Steep downhill descent into Little Miami Scenic River Valley.                                               |                                                                                     |
| Lane Width:        | 11 ft.; no shoulder.                                                                                        |                                                                                     |
| Physical Barriers: | Road is very steep and has many sharp curves. Most bicyclists will not be able to ride up or down the hill. |                                                                                     |
| Other:             | Closest route to Mason neighborhoods. ODOT or Warren County approval required to use I-71 overpass.         |                                                                                     |

- + Closest river crossing.
- Extremely sharp curves leading to bridge.
- Downhill descent leading to the bridge is too steep for most bicyclists to negotiate.
- Uphill ascent will prevent all but the most avid bicyclists from riding out of the valley.
- Narrow lanes.

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Speed Limit:       | 50 m.p.h. Winter, 45 m.p.h. Summer                           |
| Traffic Counts:    | 11,315 (Warren County, 1999).                                |
| Topography:        | Relatively flat.                                             |
| Lane Width:        | Adequate lane width, plus 9-foot wide asphalt shoulder.      |
| Physical Barriers: | None.                                                        |
| Other:             | Increased summer traffic due to Kings Island, may limit use. |

|                    |                                                                                              |                                                                                     |
|--------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Speed Limit:       | 35 m.p.h.                                                                                    |  |
| Traffic Counts:    | 5,686 (City of Mason, 1999).                                                                 |                                                                                     |
| Topography:        | Rolling terrain; steep hills.                                                                |                                                                                     |
| Lane Width:        | Narrow (9.5 ft.); no shoulder.                                                               |                                                                                     |
| Physical Barriers: | Steep hills and sharp curves will prevent most bicyclists from using or enjoying this route. |                                                                                     |
| Other:             | Traffic appears to travel much faster than 35 m.p.h.                                         |                                                                                     |

|                    |                                                                                                             |                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Speed Limit:       | 35 m.p.h.                                                                                                   |  |
| Traffic Counts:    | Not available.                                                                                              |                                                                                     |
| Topography:        | Significant elevation change.                                                                               |                                                                                     |
| Land Width:        | 9 to 10 feet; no shoulder. Concrete wall and guard rail close to shoulder. Little room to "share the road." |                                                                                     |
| Physical Barriers: | Road slippage; significant elevation change; many sharp turns; many automobile accidents.                   |                                                                                     |

- Relatively high-traffic volume.
- Narrow bridge lanes; no shoulder.
- Farthest river crossing from Mason.
- Bicycling to this crossing is not appropriate for most bicyclists due to narrow roads and steep hills that are encountered riding from Mason.



- < Kings Mills Road to Columbia Road to Mason-Morrow-Millgrove Road: This route is designated as a blue line at Kings Mills Road and a red line at Columbia Road. Kings Mills Road carries a considerable amount of traffic, but it has eight (8) foot wide paved shoulders between Parkside Drive and Courseview Drive that could be designated as bicycle lanes. The shoulder (concrete curb) tapers down to two (2) feet wide from Courseview Drive to the I-71 overpass. This narrow section would have to be widened.

The I-71 overpass has two 10 foot wide paved shoulders, but permission to use the overpass as a bicycle lane or route is required from Warren County or the Ohio Department of Transportation. Columbia Road, between Kings Mills Road and Mason-Morrow-Millgrove Road, is best characterized as rolling with one steep hill that precludes most Group B/C riders from using this route.

- < Kings Island Drive to Kings Mills Road to Columbia Road to Mason-Morrow-Millgrove Road: The red line on Map 6 depicts this route. This route is circuitous but it is feasible. Kings Island Drive has wide paved shoulders that would adequately accommodate bicyclists. A disadvantage is the two (2) relatively close turning movements required at the Kings Island Drive / Kings Mill Road and Kings Mills Road / Columbia Road intersections. As mentioned above, Columbia Road north of Kings Mills Road is rolling with a relatively steep hill. Another constraint is the busy intersection located at Western Row Road and Kings Island Drive.

- **Kings Mills Road:** This route is designated as a blue line on Map 6. The Kings Mills Road connection is very direct from Mason, but the slope of the road southeast of the Village of Kings Mills is very steep. The slope of the road will preclude all but the most avid bicyclists from pedaling up the hill and out of the river valley. Group B/C riders should not attempt to ride down the road segment located in the Little Miami Scenic River Valley. Again, permission from Warren County or the Ohio Department of Transportation is needed to designate the I-71 overpass as a bicycle facility/route.

- < Kings Island Drive to Kings Mills Road: This route is shown as a yellow line on Map 6. As an alternative to the above route, bicyclists could take Western Row Road to Kings Island Drive to Kings Mills Road. This route circumvents the I-71 overpass at Kings Mills Road. Kings Island Drive has wide paved shoulders that would easily accommodate bicyclists.

The Western Row Road/Kings Island Drive intersection is very busy. If this route is implemented, a short side path should be provided on the west side of Paramount's Kings Island Drive that ends at the southern most signalized intersection leading into the Kings Island parking lot. Bicyclists must overcome the hill going into and out of the river valley. The route is not as direct as the Kings Mills Road route.

- **Western Row Road/Socialville-Fosters Road:** This route is designated by the purple line on Map 6. The Western Row Road / Kings Island Drive intersection is wide and very busy. An on- and off-ramp for I-71 also feeds into this intersection. Western Row Road, east of Kings Island Drive, is narrow and it has three (3) sharp turns and two (2) relatively steep hills.

The majority of Socialville-Fosters Road, east of Western Row Road, is very steep and narrow. A guard rail (on the north and east sides of the road) and a ditch and a concrete wall (on the south and west sides of the road) do not provide adequate room for bicyclists and motor vehicles to share the road. Another constraints includes road slippage (induced by sudden and sharp curves), which results in automobile accidents each year.

The road width, topography, and sharp turning movements that characterize this route from Mason precludes all but the most experienced bicyclists from taking this route. Additionally, this route is not direct from Mason and it is accessible only to neighborhoods located in the southern section of the City.

### ***Preferred Route***

The Steering Committee did not find any of the possible connections totally acceptable for Group B/C riders. Topography, in each case, limits the use of any of these routes as a viable connector. Being compelled to at least identify the best route, the Steering Committee selected the route that had the fewest constraints to overcome. The route that has the flattest topography and the lowest speed limits and traffic counts was selected. Any route that is implemented will need to be studied and engineered to overcome as many safety issues as possible.

The Steering Committee identified the **Countryside YMCA Trail** river crossing as the preferred location to cross the Little Miami Scenic River. The preferred route to the Countryside YMCA Trail is:

- **Cox-Smith Road and Mason-Morrow-Millgrove Road:** A few issues must be adequately addressed before this route can be considered a safe and viable route for Group B/C riders. The sudden grade change on Cox-Smith Road near Mason-Morrow-Millgrove Road must be ameliorated. Either the slope of the hill must be decreased or a side path (switch-back) must be provided that circumvents the Cox-Smith Road / Mason-Morrow-Millgrove Road intersection. The intersection by-pass could tie into a future bicycle path that runs parallel with Mason-Morrow-Millgrove Road.

Land uses adjacent to Cox-Smith Road is primarily low-density residential. Road widening should occur to accommodate bicyclists in route to the Countryside YMCA Trail.

The Steering Committee's second choice is:

- **Mason-Morrow-Millgrove Road:** If this route is implemented, Mason-Morrow-Millgrove Road will need to be widened to have fourteen (14) foot wide lanes, or wider, to have adequate room for bike lanes or routes (signed shared roadway). The bridge (culvert crossing) located west of Cox-Smith Road also needs to be widened. This bridge currently has two 10 foot wide lanes with an eighteen (18) inch wide shoulder.

A bicycle path, starting at U.S. 42, would best accommodate Mason and Warren County Group B/C bicyclists. Providing a separated bicycle path may be cost prohibitive due to the length and excavation (i.e cut and fill) required to construct the facility.

### ***Alternative Route***

- **Countryside YMCA Trail via Kings Mills Road, Columbia Road and Mason-Morrow-Millgrove Road:** This route should be pursued only if the preferred routes mentioned above are not feasible from an implementation, safety, or engineering perspective.

### ***Routes Not Selected***

- **Fosters-Maineville Bridge via Western Row Road and Socialville-Fosters Road:** The Western Row Road/Socialville-Fosters Road route was not selected due to the route's unique road design and associated topography. Due to these characteristics, the Steering Committee felt the use of this route was not safe and, therefore, not appropriate. Distance from the City was another consideration, but this distance was not as important as safety.
- **Countryside YMCA Trail via Kings Island Drive to Kings Mills Road to Columbia Road to Mason-Morrow-Millgrove Road:** This route is out of the way and bicyclists must overcome the large hill on Columbia Road between Kings Mills Road and Mason-Morrow-Millgrove Road.
- **Kings Mills Road & Kings Island Drive to Kings Mills Road:** These routes are not safe for most bicyclists due to the steep slope and sharp curves associated with Kings Mills Road southeast of the Village of Kings Mills.

## VI. IMPLEMENTATION STRATEGIES

### A. *Update City Ordinances and Plans*

- **Zoning and Subdivision Regulations:** The City's Zoning Ordinance and Subdivision Regulations should be updated to require all new developments to provide bicycle and pedestrian facilities as called for in this plan. Where property in question abuts a thoroughfare planned for future bicycle and pedestrian facilities, the development should get approval contingent upon providing the appropriate facilities or making other agreeable arrangements.

For instance, where a development is located next to a thoroughfare proposed to have a bicycle path, the developer should be required to provide the needed right-of-way and to pay for some or all the cost to develop the proposed bicycle path. Implementing this recommendation will diminish the City's burden to pay for every improvement proposed in this plan.

- **Require Grid or Connected Curve-linear Street System:** Interconnected streets offer the most direct route between two (2) points. Cul-de-sacs and dead end streets require long and circuitous routes to cover a relatively short, straight-line distance. Increased distance as a result of a circuitous route decreases pedestrian and bicycle trips.
- **Access Easements at Dead Ends:** New subdivisions with dead end streets should be required to provide a twenty-two (22) foot wide access easement that provides pedestrian and bicycle access to adjacent neighborhoods, streets and arterial and collector roads.
- **Sidewalks:** Sidewalks are required in the City's Subdivision Regulations, but construction timing is not addressed. Construction timing is especially important in residential subdivisions. There are usually vacant lots in newer subdivisions that do not have sidewalks. To avoid gaps in a subdivision's sidewalk system, the City should require developers to construct the remaining sidewalks after the majority of lots are sold or built. Seventy-five (75) percent is a reasonable threshold.
- **Evaluate Plan:** Realizing that priorities, support and resources change over time, this plan should be reviewed and updated on an as-needed basis. Particular attention should be paid to the prioritization of projects and estimated project cost.

### B. *Safety Considerations*

- **Maintenance:** A maintenance program is required to ensure that all bicycle facilities are in good maintenance and are safe to use. Bicycle facilities need to be swept on a regular basis to remove any debris or stones that can cause bicyclists to lose control. Bicycle tires cannot absorb shock or roll over debris like an automobile tire. Sweeping is especially important on bike lanes and bicycle routes where bicyclists share the road with motor



vehicles. Sidewalks with trip hazards, such as missing concrete, cracks, and heaving, need to be replaced.

- **Monitoring:** Bicycle facilities need to be routinely inspected for safety hazards, such as missing pavement, large cracks, low tree limbs, and other obstructions. The City should consider hiring a full-time bicycle and pedestrian coordinator or give an existing staff person this responsibility. A coordinator could also look for missing or damaged signs and for road striping and markings that need replaced.
- **Inventory and Analyze Crash Data:** All pedestrian and bicycle accident data should be recorded and analyzed to identify safety hazards and to devise solutions to increase safety.
- **Enforcement:** Federal, state, and local laws that regulate bicycle transportation must be enforced. Ohio law defines bicycles as a vehicle. Bicyclists have equal rights to use roads and they must follow the same traffic laws. This includes obeying all signs and stop lights and using lights at night. Laws governing bicycles in Ohio are provided in Appendix B.

Enforcement, along with the other safety considerations, can reduce accidents and save lives. Accordingly, an increased law enforcement presence consisting of a police bicycle patrol may further encourage bicycle safety and conformance with the law.

- **Restrictions:** Restrictions regulate bicycle facility use above and beyond what state law requires. For instance, Mason may require or strongly urge all bicyclists to wear a helmet. Some restrictions on bicycle routes (shared roadway facilities) may not be appropriate since bicycles are by law treated the same as motor vehicles. Restrictions may be appropriate on bicycle paths, because they are physically separated from the road and in parks or other public spaces. Common restrictions include:

- < **Time:** Access to facilities in parks or other public areas can be limited to daylight hours only.
- < **Equipment:** Helmets can and should be required of all bicyclists who use local streets and bicycle facilities.
- < **Pets:** Pet restrictions can prohibit all pets or require dogs to be leashed.
- < **Use:** In most cases, bicycle and pedestrian facilities are reserved for the exclusive use of non-motorized transportation sources only. Motor vehicles including mopeds, gas operated scooters, golf carts, and electric bicycles do not mix with pedestrians or bicyclists and should be prohibited.

- **Education:** Education is necessary to ensure that the local population is properly trained to use Mason's bicycle and pedestrian facilities. Education builds confidence, which is needed by many younger individuals and adults who have limited bicycling experience. Classes should be offered frequently at times and locations that are accessible to a wide range of the population.

Children, in particular, are not aware of the rules of the road. Classes should teach children of bicycle safety and laws including, but not limited to:

- < how to ride with traffic;
- < to look for and react to hazards such as pot holes, limbs, gravel, or other debris;
- < to watch for opening car doors;
- < when to take the lane;
- < to obey traffic signals and laws;
- < to make proper turning movements with appropriate hand signals;
- < to stop properly;
- < how to be visible;
- < riding habits to avoid such as riding against traffic or darting out into traffic; and
- < how to properly cross railroad tracks.

- **Bicycle Coordinator:** Many communities hire full-time bicycle coordinators to run classes, clinics, and seminars on pedestrian and bicycle safety. Some of these same coordinators are also responsible for monitoring the pedestrian and bicycle network for safety and maintenance issues. Engineers, planners, and recreation specialists not trained specifically in pedestrian and bicycle transportation systems may not recognize hazards or community needs.

### ***C. Multi-jurisdictional Cooperation*** \_\_\_\_\_

Many road and highway improvements require the approval of numerous jurisdictions including Warren County, O-K-I, and the State of Ohio. Coordination is needed to ensure that all transportation improvement projects are designed and constructed to foster increased bicycle use and safety. Since the State of Ohio and Warren County and, to a lesser extent, O-K-I make decisions regarding some roads in Mason, these entities must be made aware of the City's plans to create a bicycle facility network for its residents.

The U.S. Department of Transportation recommends that all streets accommodate safe bicycle operation. All new roadways and roadway improvement projects should be designed to accommodate both bicycles and automobiles even if the road is not identified as a bicycle corridor in this plan or the City's Thoroughfare Plan. This is best accomplished by providing wide curb lanes or paved shoulders on collector and arterial roads. This will benefit the entire community as Group B/C riders become more comfortable and skillful.

## ***D. Financing Tools***

---

Successful implementation of this Plan will depend on the ability of the City to secure necessary financing. Besides the General Fund, the following sources of revenue are available to the City:

### ***Millage, Assessments, and Bonds***

- **Dedicated Millage:** Special millages can be used to generate revenues for a specific purpose. For example, the Mason community could vote to establish a dedicated property tax millage to support the development of the bicycle and pedestrian way improvements.
- **Special Assessments:** Special assessments are compulsory contributions collected from the owners of property benefitted by specific public improvements (paving, drainage improvements, etc.) to defray the costs of such improvements. Assessments may be useful in filling in the gaps in Mason's sidewalk system. Assessments can also be placed on property owners for the construction of bicycle facilities abutting their property.
- **Bond Programs:** Bonds are one of the principal sources of financing used by communities to pay for capital improvements. General obligation bonds are issued for specific community projects and are paid off by the general public with property tax revenues. Revenue bonds are issued for construction of projects that generate revenues.

### ***Grants***

- **Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21):** In 2000, the Ohio Department of Transportation (ODOT) distributed more than \$15 million to over fifty (50) Ohio communities for a variety of transportation enhancement projects. This funding is provided through the TEA-21 landmark legislation, which was passed by Congress in 1998. TEA-21 requires each state to set aside ten (10) percent of their Surface Transportation Funds for Transportation Enhancement projects including bicycle and pedestrian facilities, transportation beautification projects, and historic preservation projects.

Awarded grants ranged from \$15,000 to more than \$1.5 million in 2000. Thirty-six (36) communities received grants for bicycle and pedestrian facility projects followed by eleven (11) historic preservation projects and three (3) beautification projects. ODOT received 126 applications from fifty-seven (57) counties. Transportation Enhancement Grant applications can be submitted to either the Ohio Department of Transportation or OKI.

- **Recreational Trails Program (RTP):** In addition to the Enhancement Grant, the State of Ohio has set aside additional TEA-21 funds to fund the Recreational Trails Program. Approximately \$1.3 million in funds are allocated for each fiscal year between 2001 through 2003. Funding beyond 2003 is contingent upon TEA-21 legislation being renewed. Grant applications are due on February 1<sup>st</sup> of each year.

Grant applications are competitive and a twenty (20) percent match is required. Project costs are paid by the community and recovered through reimbursement payments through the Ohio Department of Natural Resources (ODNR).

RTP grant money cannot be used next to a road. This funding is earmarked for recreational trails as opposed to trails that serve as transportation routes. Eligible projects include: development of trail linkages; maintenance and restoration of existing trails; development and rehabilitation of trail side and natural head facilities such as drainage, crossings, parking, signage, shelters, and water and sanitary facilities; purchase and lease of recreational trail construction and maintenance equipment; new recreational trails (provided that they comply with state and federal regulations); easement acquisition; and education programs not to exceed five (5) percent of the State's apportionment.

Competitive applications must meet specific goals as found in Ohio's Statewide Comprehensive Outdoor Recreation Plan. Each grant application is weighed against a twenty-three (23) point priority rating system. Higher application scores increase a community's chance to successfully receive grant money. As the case with most grants, applications with a higher local match are given extra consideration. Applications are available from the ODNR, Division of Real Estate and Land Management.

- **Land and Water Conservation Fund (LWCF):** The LWCF is a federal program aimed at providing resources to maintain, develop and preserve outdoor recreational resources. This program provides up to fifty (50) percent reimbursement assistance. Local governments must be able to finance project costs up-front until reimbursement payments are made. Other federal and state grants may be used to help offset some of the local match requirement. ODNR requires that a minimum of twenty (20) percent of the project be funded with non-federal funds. Applications are due July 1<sup>st</sup> each year.

The LWCF is authorized by the federal government to continue through 2015. Funding for fiscal year 2002 is uncertain and contingent upon the federal budget decision.

- **NatureWorks:** NatureWorks was established in 1993 when Ohio voters passed a statewide levy providing for the Ohio Parks and Resources Fund. The program, administered by ODNR, provides seventy-five (75) percent reimbursement assistance to local governments in Ohio. Program funds can be used for acquisition, development, or rehabilitation of public park and recreation areas, including trails. A twenty-five (25) percent match is required; however, other grants may make up five (5) percent of the local match requirement. Applications are due July 1<sup>st</sup> of each year.

Each Ohio county receives a fixed dollar amount from the state. No proposal can exceed the county's annual allocation. Warren County's current allocation is \$45,000. The City must have proper control (title or at least a 15-year non-revocable lease) to be eligible for a park or recreation development or rehabilitation grant.

- **Clean Ohio Fund(Issue 1):** The Clean Ohio Fund is voter-sponsored legislation enabling the state to issue bonds for numerous public improvements including recreational trails. Twenty-five (25) million dollars spread over four (4) years is proposed to be dedicated for trail-related projects including:
  1. Trail construction;
  2. Acquisition of easements for trail development;
  3. Maintenance and restoration of existing trails;
  4. Development and rehabilitation of trail head and trail side amenities including, drainage, water and sanitary facilities, parking, signage, and shelters, etc.; and
  5. Trail planning, including design and engineering costs.

The first call for grants is expected sometime in late 2001 or early 2002. The program is being studied at the state level. Information regarding the Clean Ohio Fund is tentative and may change pending the state's official policy, which should be established by summer 2001.

Successful grant applications will be selected on "demonstrated need" as determined by the ODNR and the Ohio Trail Advisory Board. Other criteria from the Ohio *Statewide Trail Plan* will also be used to select successful grant applications. This grant program requires a twenty-five (25) percent grant match.

### ***Private Sources***

Corporations, non-profit organizations, and foundations should be considered to help finance bicycle related public improvement projects.

### ***E. Public Outreach***

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Effort must be made to inform and educate residents about the plan, the resources needed to implement the plan, and the benefits of walking and bicycling. Successful implementation requires the support and active participation of residents, property owners, and business owners. A thoughtfully prepared public outreach program is needed that creates a sense of ownership by the entire community.

### ***Marketing Materials***

To gain support for the plan, the community should be made aware of the many benefits that bicycle facilities bring to a community. These health, environmental, and economic benefits should be marketed through public outreach activities. Flyers and pamphlets can address important items such as bicycle safety and bicycle laws.

## **Maps**

Once the Mason bicycle path network is established, maps should be made available to the public. The purpose of the map is to graphically illustrate trail destinations, connections, and locations. Other items can be conveyed on the map, such as safety tips and trail restrictions, if any.

## **F. Bicycle Friendly Community**

The city that promotes bicycling and meet six (6) out of eight (8) prescribed criteria set by the League of American Bicyclists are eligible to become a “Bicycle Friendly Community.”

### **Primary Criteria**

The primary criteria, which must be met, are:

1. The City has a written policy designed to develop and maintain “Bicycle Safe” streets and paths.
2. The City budgets and spends one (1) dollar per capita per year on bicycle facilities and events.
3. The City recognizes the month of May as “National Bicycle Month” and encourages residents to observe “Bike-to-Work Day” through an annual proclamation.
4. The City has an established Bicycle Advisory Committee and a designated “bicycle-issues” coordinator on staff.

### **Secondary Criteria**

The secondary criteria, of which two (2) must be met, are:

1. Bicycle-safety instruction is taught in schools, stressing bicycle handling skills and the wearing of helmets.
2. The City encourages and supports bicycling activities.
3. The City publishes bicycling information, identifying routes and stressing safety.
4. The City provides public bicycle parking facilities and encourages private bicycle parking facilities.

### **Benefits**

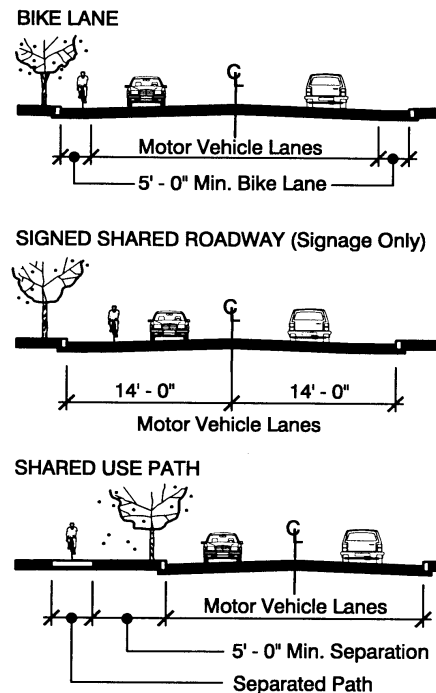
The City will receive “Bicycle Friendly Community” highway signs to post at City entrances, and a plaque to hang in the Municipal Building. Other benefits include a subscription to the bi-monthly *Bicycle USA* and the quarterly *Bicycle Friendly Communities* newsletter.



## VII. DESIGN MANUAL<sup>2</sup>

### A. Bicycle Facility Design Types

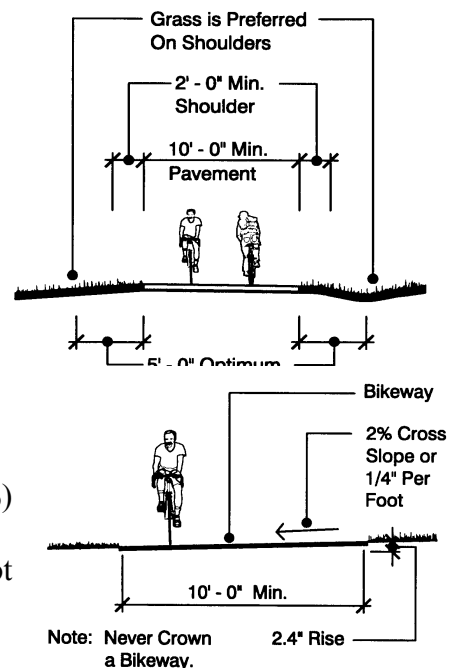
- **Bicycle Lanes** typically carry one-way traffic in the same direction as adjacent motor vehicle traffic. They are typically five (5) feet wide and they demarcate and segregate motor vehicle and bicycle transportation through the use of pavement markings.
- **Bicycle Routes (Signed Shared Roadway)** are found on streets and highways with no special treatment for bicyclists except for directional signage.
- **Bicycle Paths (Shared Use Path)** are separated from roads by a barrier and either within the road right-of-way or within an independent right-of-way.



### B. Bicycle Paths

#### Specifications

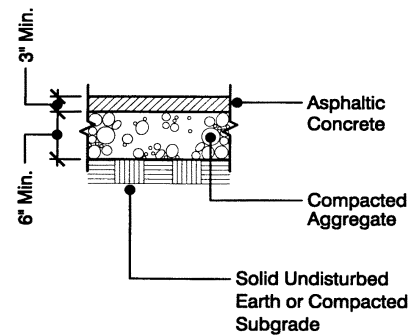
- **Width:** The minimum width for a bicycle path should be ten (10) feet.
- **Shoulder Material:** Twenty-four (24) inches of compacted gravel next to the path surface with a minimum of four (4) inches finished with grass seed.
- **Shoulders Width:** Path shoulders should be at least two (2) feet but not more than (5) feet wide on both sides. Shoulders should be level to the path surface.
- **Grade:** Avoid grades five (5) percent or greater. Path segments, with grades equal to or greater than five (5) percent, should not be over five hundred feet (500) feet in length.
- **Slope:** The slope of the path should be two (2%) percent for adequate drainage.
- **Crown:** The crowning of a bicycle path is not recommended.



<sup>2</sup>All illustrations and graphics found herein are taken from the 2000 *Bicycle Friendly Manual* and the 1999 *Guide for the Development of Bicycle Facilities*.

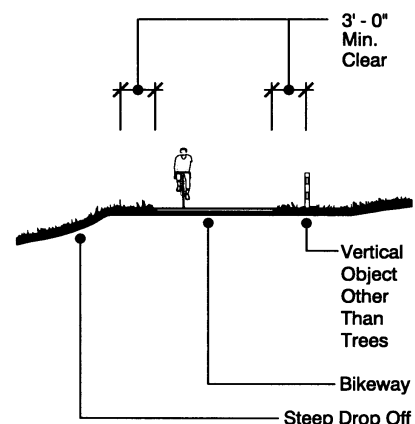


- **Bicycle Path Pavement Detail:** Bicycle paths should be constructed with a six (6) inch minimum compacted aggregate base in two (2) lifts and three (3) inches of asphalt in two (2) lifts. The aggregate base should be increased to eight (8) inches where maintenance trucks and emergency vehicles have access.

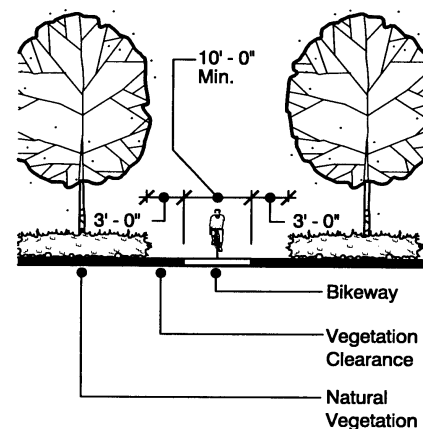
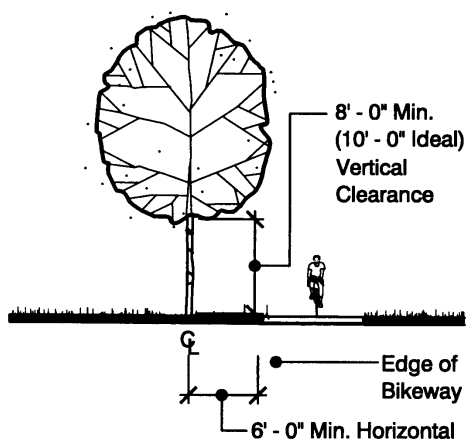


Note: Where Heavy Truck Traffic is Expected Thicken Aggregate to 8".

- **Clearance:** A three (3) foot minimum clearance shall be maintained between the edge of a bicycle path and a vertical element such as culverts, drainage channels, embankments, fences, lighting, nearby buildings, posts, railings, street furniture, supports for overhead structure, and trees.
- **Vegetation Clearance Zone:** Vegetation must be mowed or trimmed regularly to maintain a three (3) foot wide clearance zone from the edge of the bicycle path.
- **Tree Clearance:** Trees shall be planted at least six (6) feet from the edge of the path. The first tree limb shall be at least eight (8) feet high, measured from grade.

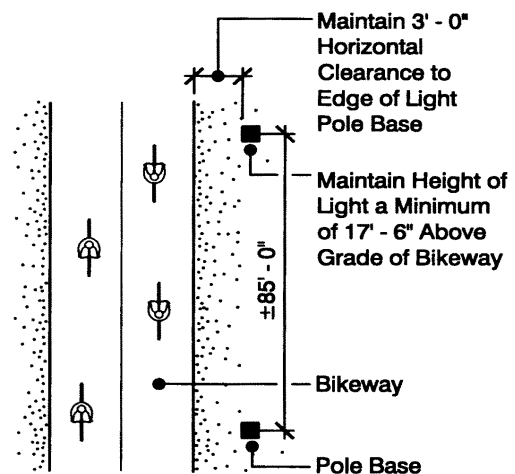


Note: 3' - 0" Min. Between Edge of Bikeway And Any Obstructions / Slope

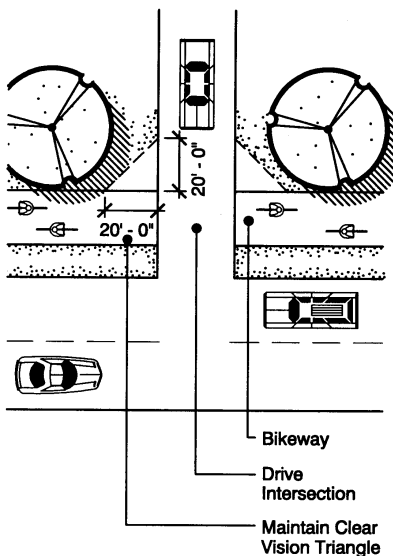


## Lighting

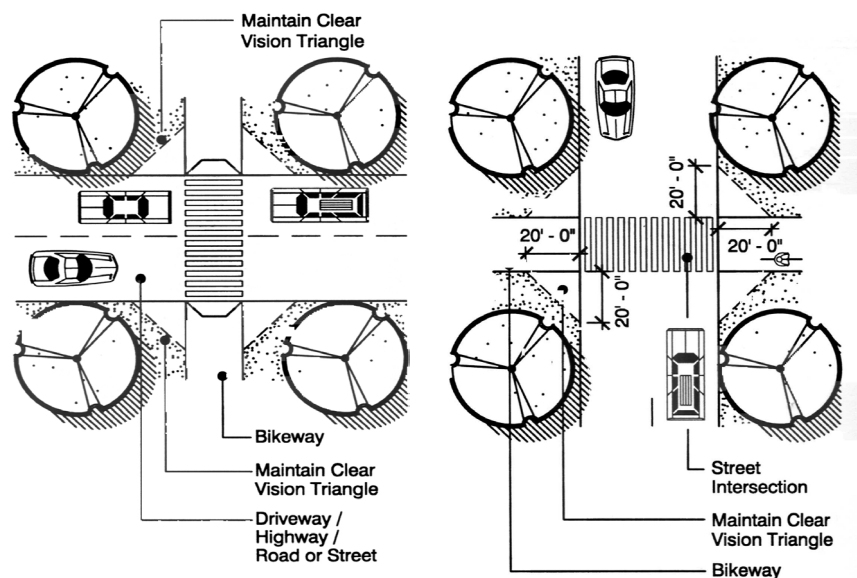
- **Light Pole Placement:** A light pole should be placed every eighty-five (85) feet, plus or minus, depending on pole height, light type and wattage.
- **Light Pole Clearance:** The center of the light pole base shall be no closer than three (3) feet to the edge of the path.
- **Light Pole Height:** The lighting fixture should be a minimum of 17.5 feet above the bicycle path grade.



## Unobstructed Site Distance



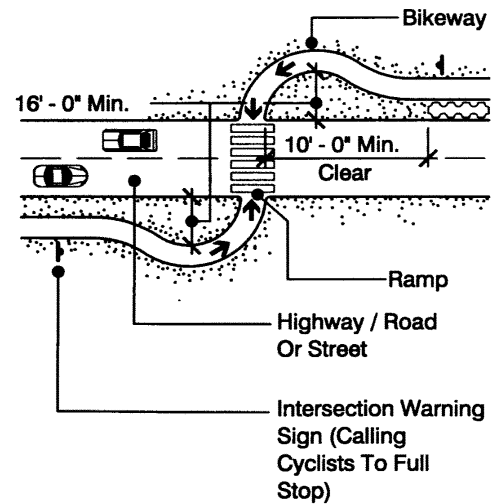
- **Site Triangle:** The vision triangle is formed by two (2), twenty (20) foot triangles formed by the intersection of a driveway pavement edge and/or street right-of-way.
- **Site Obstructions:** No fence, wall, or planting located in the required site triangle shall exceed thirty (30) inches in height above the street or bicycle path pavement.
- **Design:** It should be encouraged, to the extent possible, that structures and vegetation next to or in the site triangle be spaced, staggered, or arranged in such a manner as to not form a complete or opaque visual barrier blocking motorist or bicyclist view at all bicycle access points.



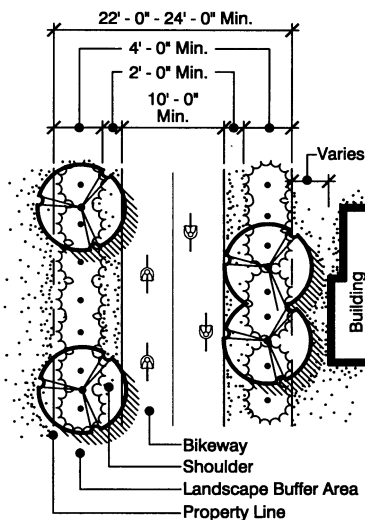
Note: Site and Distance is a Function of Speed and Intersection Geometry.

## Mid-block Crossing

- **Realignment:** Realign the path that is running parallel to adjacent road so the path intersects the road at right angles.
- **Safe Crossing:** Demarcate the path with pavement markings, refuge islands, or as an alternative, provide a traffic-control device activated by push control.
- **Signs:** Place warning sign before intersection to alert bicyclists.



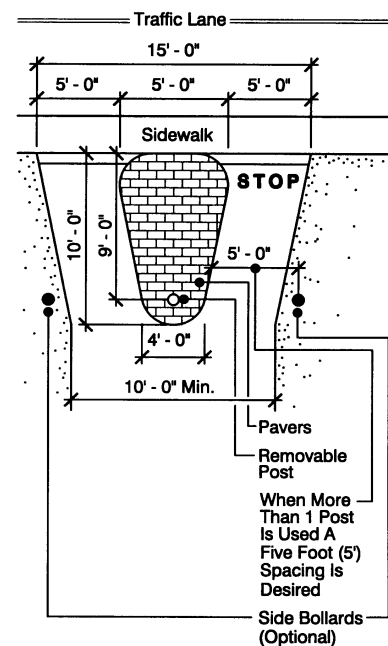
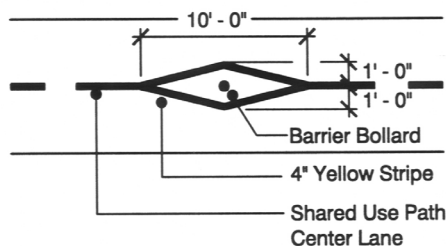
## Buffer



- **Landscape Buffer:** A landscape buffer should be provided wherever a bicycle path abuts residential property.
- **Buffer Width:** The minimum distance between the edge of a path and residential property should be six (6) feet. A ten (10) foot buffer is preferred.
- **Landscaping:** Landscaping should be provided to partially screen bicyclists and pedestrians from adjacent residential property. Landscaping must be set back at least three (3) feet from the edge of the path for safety.

## Access Control

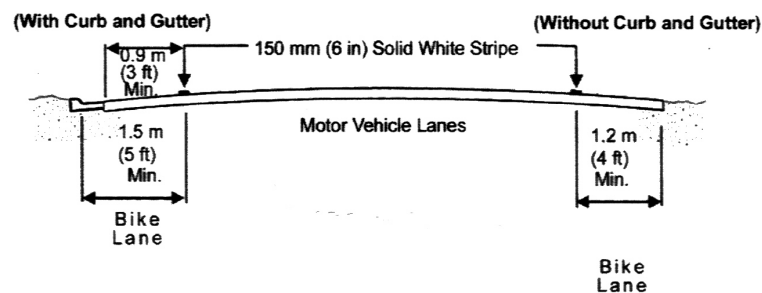
- **Bollard:** A thirty (30) inch high bollard should be provided wherever a bicycle path intersects a roadway to prevent unauthorized motor vehicles from accessing a bicycle path. The bollard should be placed a minimum of twenty (20) feet back from the roadway. The bollard should have reflective material and be removable for maintenance vehicle access.



## C. Bicycle Lanes

### Bicycle Lane Width Without On-street Parking

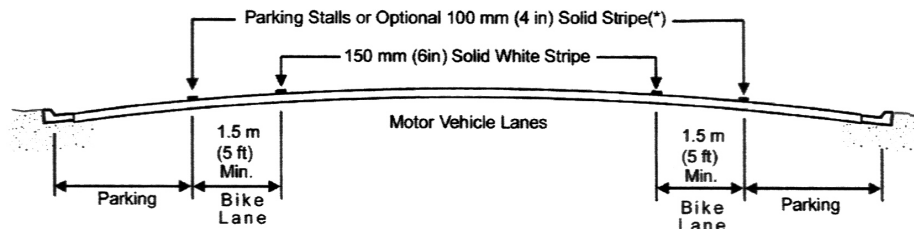
- **Without Curb and Gutter:** Four (4) feet minimum.
- **With Curb and Gutter:** Five (5) feet minimum, measured from the face of the curb to the bicycle lane stripe.
- **Joint Surface:** The joint between the gutter pan and the pavement must be smooth and flush.
- **Riding Area:** A three (3) foot wide minimum riding area is recommended not including the width of the gutter.



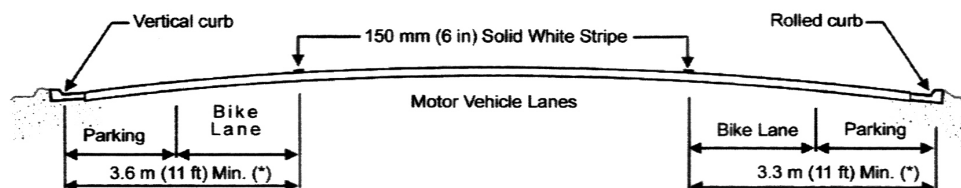
### Bicycle Lane Width With On-street Parking

*e Lane*

- **Lane Placement:** Bicycle lanes shall be placed between motor vehicle lanes and parking lanes.
- **Width With Pavement Markings:** Bicycle lanes next to on-street parking shall have a minimum width of five (5) feet.



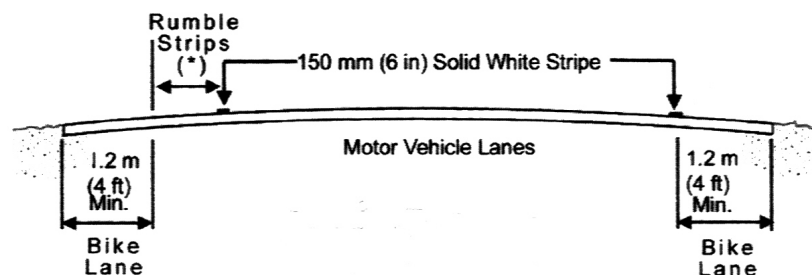
- **Width Without Pavement Markings:** The width of the parking area plus the bicycle lane shall be at least eleven (11) feet wide.



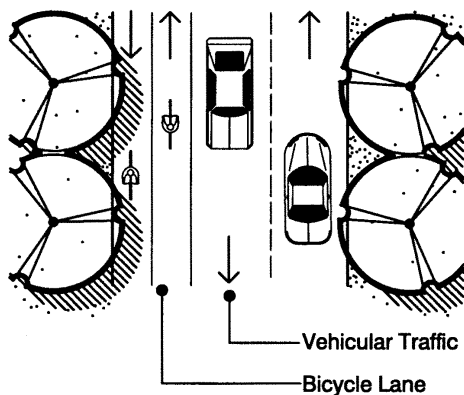
\*Thirteen (13) feet is recommended where substantial parking activity occurs.

## Bicycle Lane Width of Outlying Road

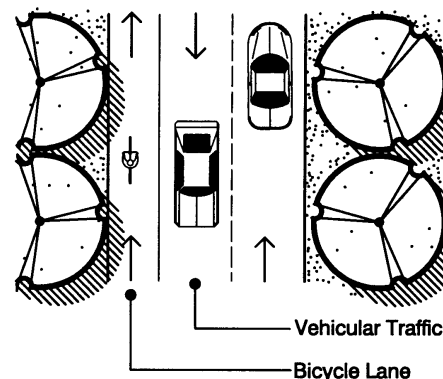
- **Appropriate Location:** In outlying areas, bicycle lanes should be located within the paved shoulder of a road. On-street parking is prohibited.
- **Width:** Lanes shall be no less than four (4) feet wide in outlying areas, but areas with high-traffic volumes and high speeds [fifty (50) m.p.h.] or greater shall be a minimum of five (5) feet wide.
- **Rumble Strip:** Rumble strips may be installed to alert motorists they are entering a bicycle lane. There should be a minimum of four (4) feet between any rumble strip and the outside edge of the shoulder.



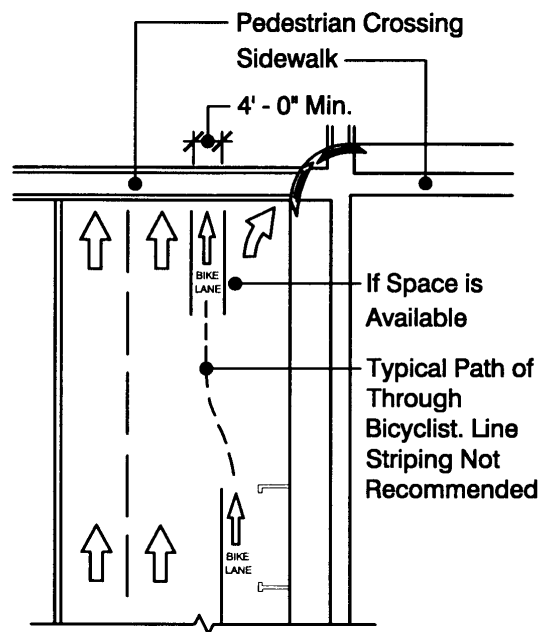
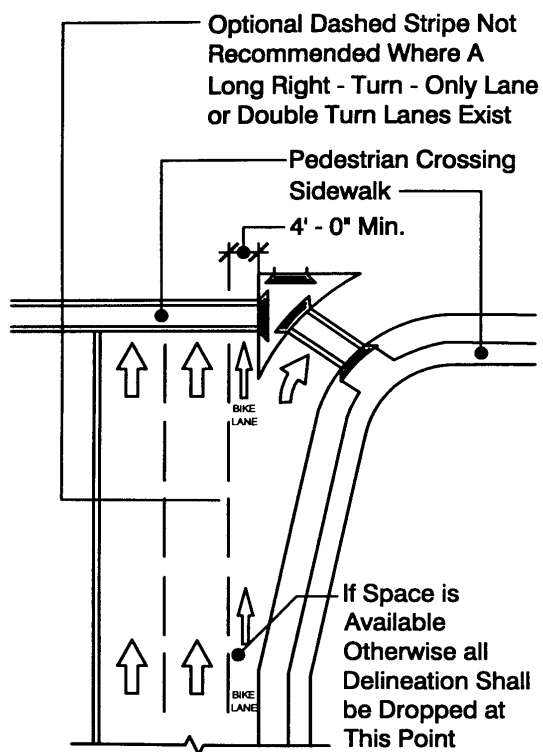
## Avoid Contra Flow Bicycle Lanes



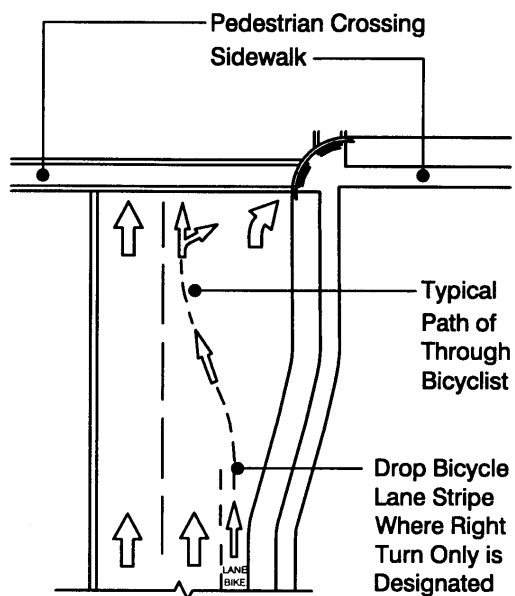
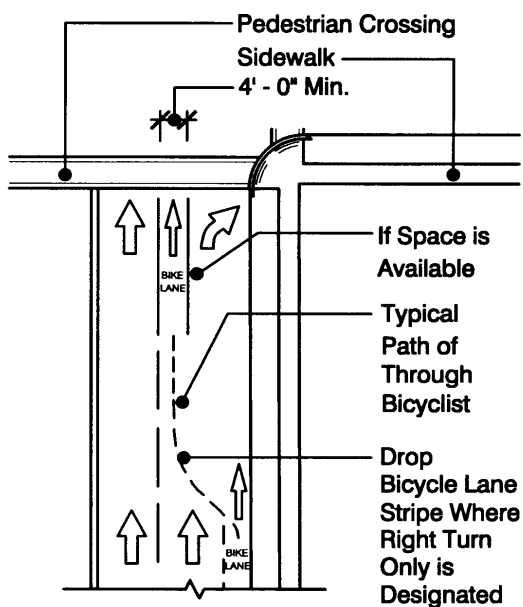
**Contra Flow:** Contra flow occurs when bicyclists ride in the opposite direction of motor vehicle traffic. Contra flow should be avoided as it results in an increased amount of bicycle/vehicle conflicts and accidents, particularly at intersections and driveways.



## Bicycle Lanes and Right Turning Lanes - Four Examples



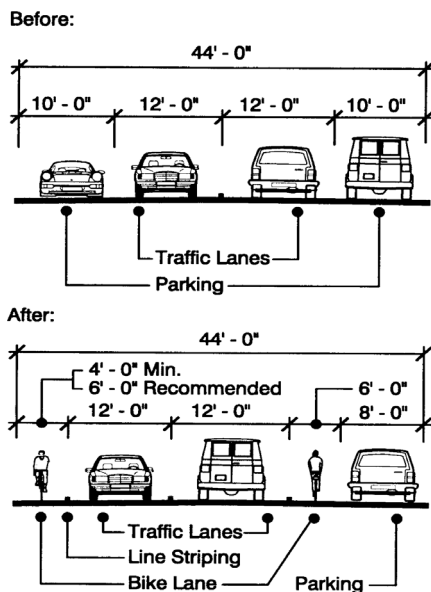
Note: Bicycle lanes are always located left of the right-



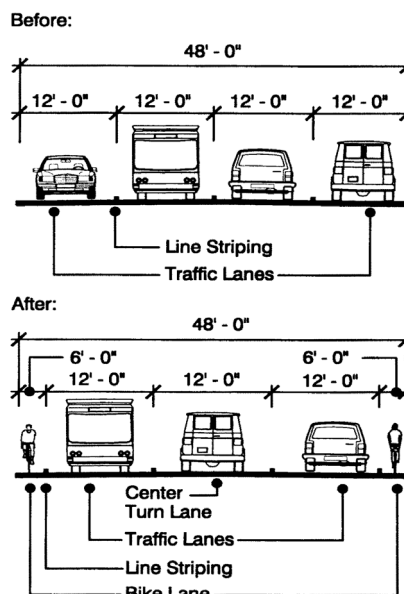
turn lane.

## Restriping Existing Roads with Bicycle Lanes

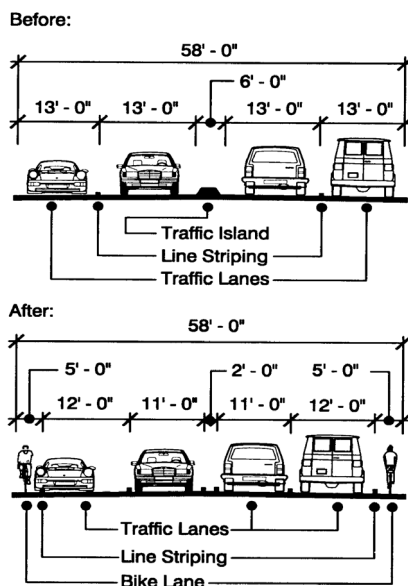
### ■ Parking Removed On One Side of Two-Way Street



### Road Lanes Reduced From Four to Three



### ■ Reduction in Lane Width to Accommodate Bicycle Lanes

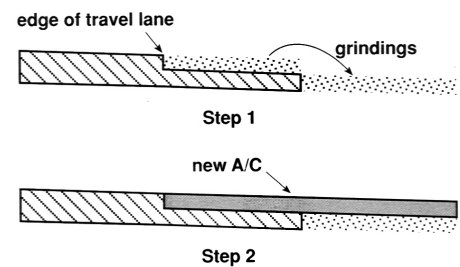
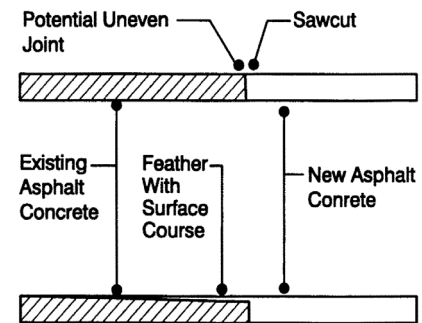




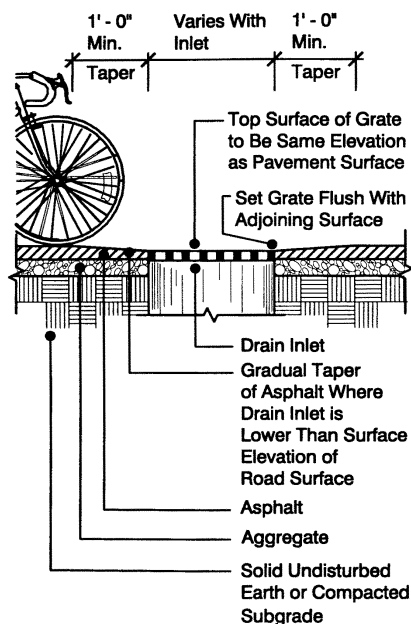
## D. Joints, Drainage, Railroad Crossings, and Driveways

### Joints

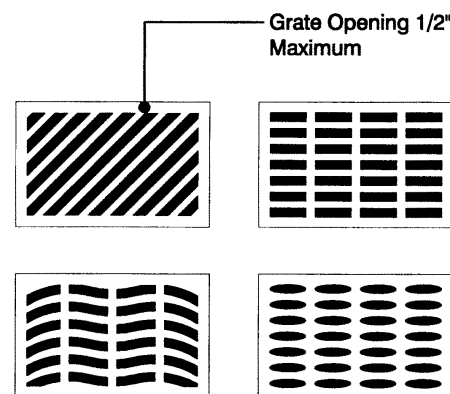
- **Adding Shoulder or Lane Width:** The two (2) techniques shown can be used to add paved lanes or shoulders where no overlay project is scheduled.
- **Saw Cut:** Cut one (1) foot from inside edge of existing pavement to eliminate ragged joint at existing pavement edge.
- **Feathering:** Feather fine asphalt material over joint to provide smooth surface.
- **Grinder:** Where a shoulder exist, a pavement grinder can be used to make a clean cut at the right depth and place the grindings to the right in one operation.
- **Gaps:** A gap no wider than one-quarter (1/4) inch should exist between two different surfaces.
- **Joints:** Pavement to gutter joints should be no more than three-eighths (3/8) inches high when parallel to travel and no more than three-quarters (3/4) inches when perpendicular to travel.

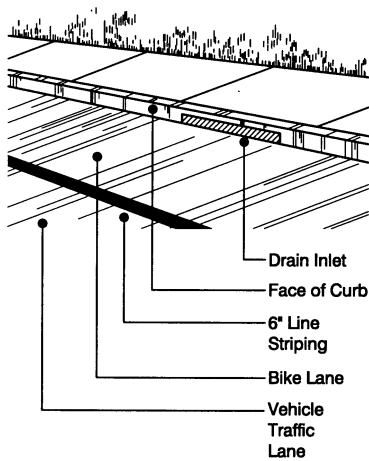


### Drainage

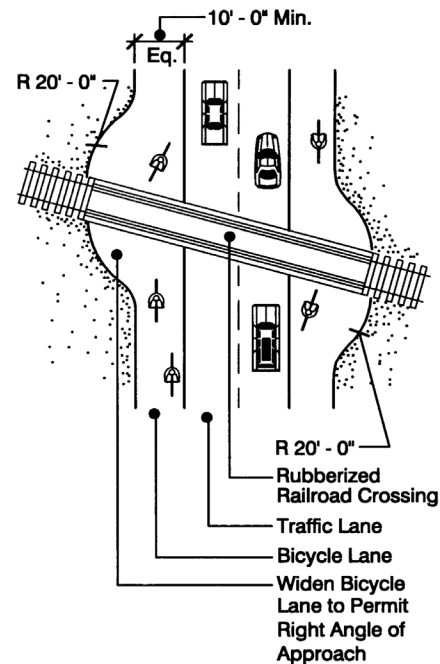


- **Drainage Grates:** Drainage gates are hazardous to bicyclists. Grates with openings wider than one-half (1/2) inch may cause crashes.
- **Location:** Drainage gates should be located as close to the curb as possible if they are constructed in conjunction with a bicycle lane or path.
- **Orientation:** Grate or basin openings should be perpendicular to the direction of travel.



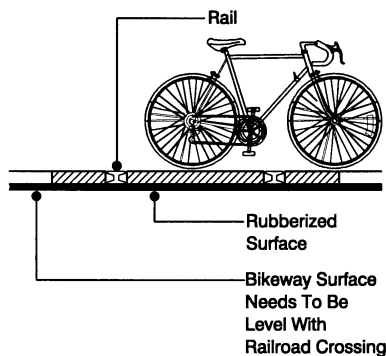


- **Curb Face Inlet:** Drain inlets incorporated into the face of the curb where bike lanes and shared roadway routes are designated are optimal.



### Railroad Crossing

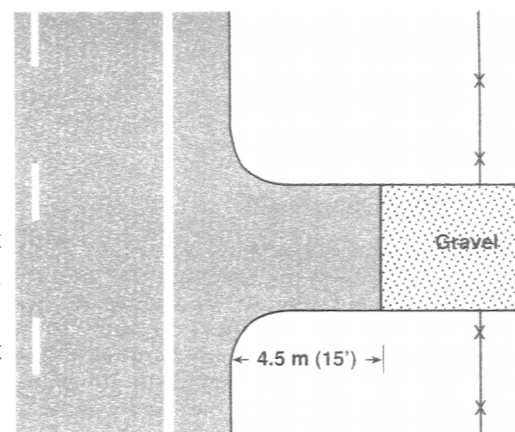
- **Intersection Angle:** Bicycle facilities should intersect railroad crossings at right angles.
- **Non-perpendicular Approach:** For bicycle lanes that cross railroads at an angle less than 45°, the bicycle lane or shoulder should be widened to improve the approach angle.



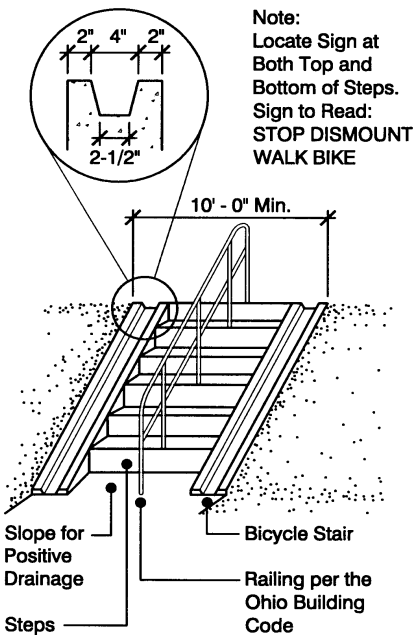
- **Crossing Elevation:** The bikeway surface should be at the same elevation as the railroad surface.
- **Crossing Surface:** Where bikeways, bicycle lanes, or routes cross a railroad, the railroad surface should be a smooth rubberized surface.

### Driveway Treatment

- **Gravel Driveways:** The first fifteen (15) feet, but not less than the first ten (10) feet of gravel driveway approaches should be paved from the edge of the bicycle facility pavement to prevent gravel from spreading onto the bicycle facility.



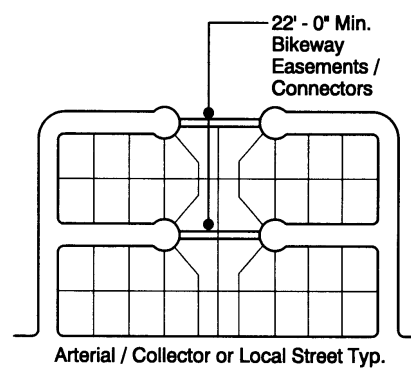
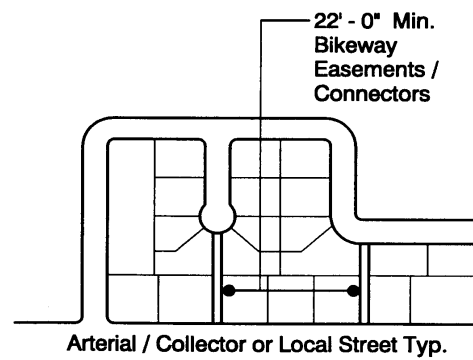
## E. Bicycle Accessibility Solutions and Alternatives



- **Bicycle Stairs:** Bicycle stairs should be located where slopes exceed desired bicycle facility angles.
- **Hand Railing:** One (1) railing is required in the center of the steps if the bicycle stair(s) is located at the edge of the steps; or two (2) railings are required at the edge of the steps if the bicycle stair is located in the middle of the steps.
- **Use:** Bicycle wheels are placed in the provided groove, and the bicycle is then pushed up or down the steps to overcome the grade differential between the top and bottom of the stairs.

### Connecting Dead End Streets

- **Access Management:** Access management standards and suburban type development often create dead end streets, which require bicyclists and pedestrians to make circuitous or out-of-the-way trips. Circuitous routes discourage bicycling walking.
- **Connecting Dead Ends to Arterial Roads:** To encourage bicycling and walking to shopping centers and community facilities, easements between dead end streets and arterial roads should be required in all new development.
- **Connecting Dead End Streets:** Dead end streets should be connected via a pedestrian/bicycle easement to encourage non-motorized transportation.

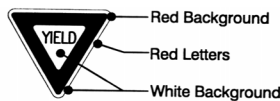


## F. Signage and Pavement Markers

- **Compliance:** All bicycle facility signage shall comply with the Ohio Revised Code and generally follow the “Manual of Uniform Traffic Control Devices for Streets and Highways” (MUTCD).
- **Purpose:** Bicycle signage: (1) directs the bicyclists; (2) regulates bicycle use; and (3) warns the bicyclist of potential hazards or changing conditions.

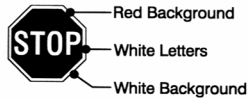
### Signage and Markings for Bicycle Paths

- **Informational Signs:** Informational signs should be grouped together. Examples include maintenance and rule signs.
- **Bicycle Path Yield Signs:** Shared use path yield signs should be 24" x 24".



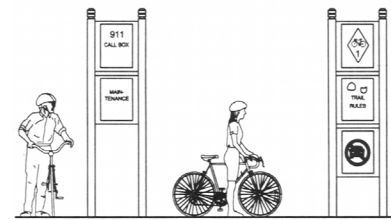
Note: Size for Shared Use Path,  
Not Lanes or Routes.

24" x 24" x 24"  
Bikeway Yield Sign



Note: Size for Shared Use Path,  
Not Lanes or Routes.

18" x 18"  
Bikeway Stop Sign



Maintenance Sign    Bike Route / Rules Sign

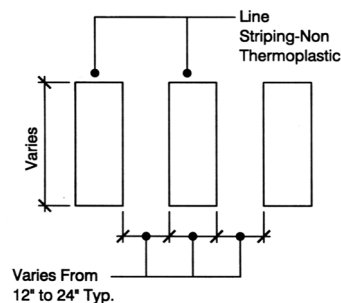
Note: Always Maintain Site Visibility  
when Signs are Installed.

- **Bicycle Path Regulatory Signs:** Shared use path regulatory signs should be 12" x 18". Bicycle path stop signs exclusively for bikeways should measure 18" x 18".
- **Bicycle Path Warning Signs:** Warning signs (diamond shape) should be used to warn riders of unexpected conditions. They should be installed no less than fifty (50) feet in advance of potential hazards. Warning signs may include:

- < Hill ahead
- < Stop ahead
- < Traffic signal
- < Railroad crossing
- < Pedestrian crossing.

- **Striping:** Yellow centerline striping is not required, but preferred, to demarcate lanes for opposing direction of travel. Lane markings are especially beneficial in high bicycle traffic areas. Centerline striping should also be used on curves with limited site distance and on approaches to hills. Where used, broken yellow centerlines should be three (3) feet long with nine (9) foot gaps. Yellow centerline striping shall be four (4) inches wide. Raised pavement markings such as reflectors should be avoided.

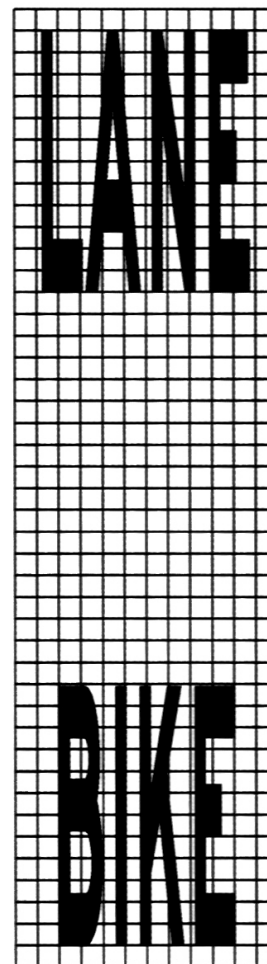
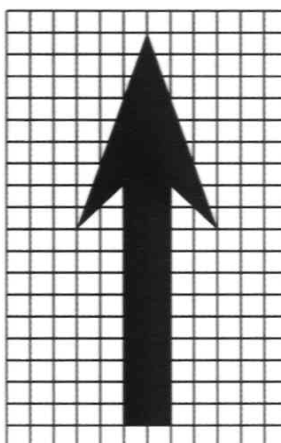
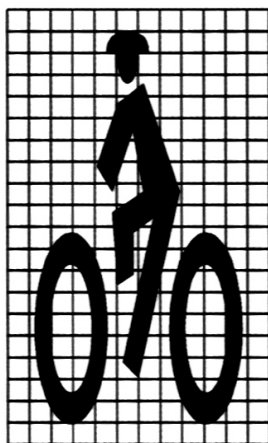
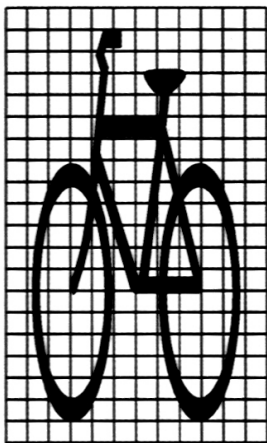
- **Road Crossing Markings:** “Zebra” or “confidential” style line striping should be used to show where a bicycle path crosses a roadway.



### ***Bicycle Lane Pavement Markers***

- **Intersection Striping:** Bicycle lane striping should not be installed through intersections.
- **Right Turn Lanes:** Where right turn only is designated, bike route line striping is not required.
- **Standard Symbols:** Standardized bicycle lane symbols should be painted in the bicycle lane to notify the bicyclists and motorists of the bicycle lane. The standard symbol is a combination of the one of the two bicycle symbols and the directional arrow. The words “bike lane” can be used instead of the bicycle symbol with the directional arrow. All symbols are typically six (6) foot high.

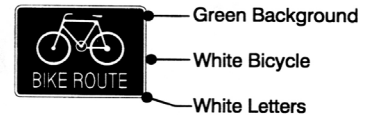
**Note:** One (1) square equals 4" x 4".



- **Placement:** Bicycle lane markings should be installed at the beginning of each block and/or at locations where there is a change in route direction.

## Local Bicycle Route (Signed Shared Roadway) Signs

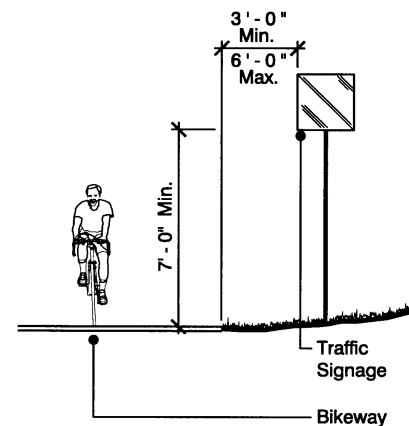
- **Size:** Local Bicycle Route signs are 24" x 18".
- **Information:** Bike route signs should include the name of the route or number of the route and direction.
- **Direction:** Destination plates should be placed underneath the Bicycle Route Sign on routes that lead to a place of interest along with a directional arrow when a turn is required.
- **Placement:** Local bicycle route signs should be placed about every one-quarter (1/4) mile, at every turn and intersection.



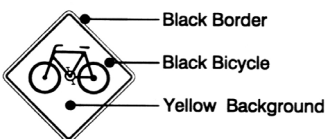
24" x 18"  
Local Bikeway Sign

## Sign Clearance

- **Vertical Clearance:** The minimum vertical sign clearance on bicycle trails should be seven (7) feet.
- **Horizontal Clearance:** All signs should be placed with the outer edge a minimum of three (3) feet from the edge of the shared use path.



## Bicycle Crossing Signs

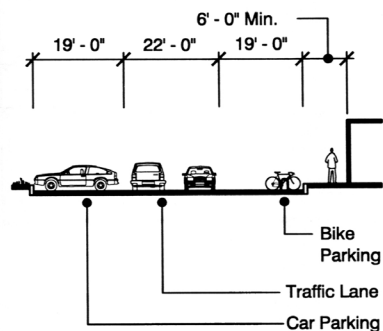


30" x 30"  
Bikeway Crossing Sign

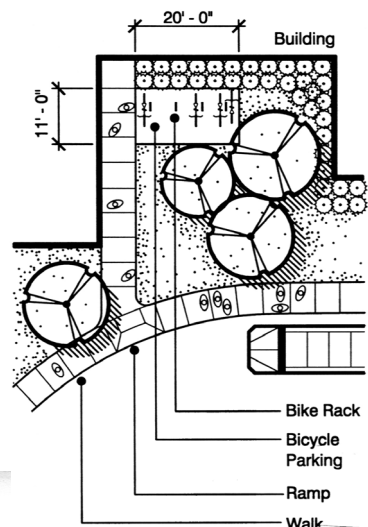
- **Placement:** Bicycle crossing signs should be located 750 feet before the crossing location in rural areas, and approximately 250 feet in urban residential or business areas where speed limits are lower. Bicycle crossing signs may not be needed at intersections with push-button crossing controls.

## G. Bicycle Parking

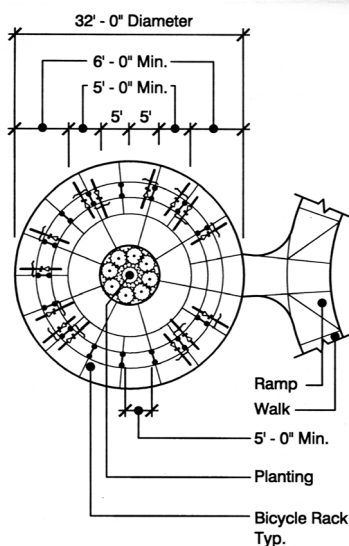
### Near a Building Next to Traffic Lanes



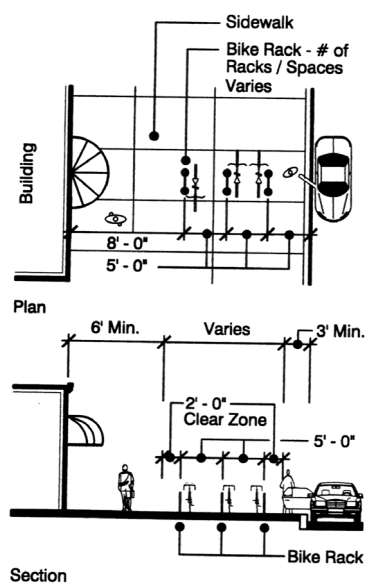
### Next to a Building



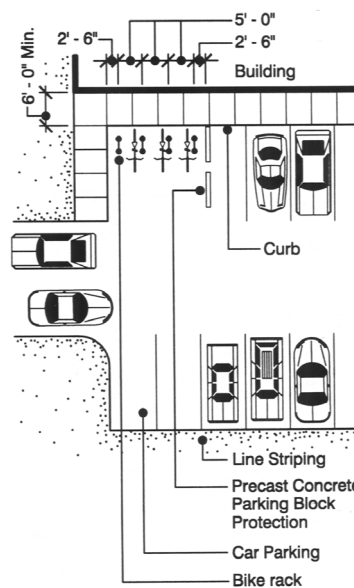
### In a Park



### Downtown



### In a Vehicular Use Area



## ***H. Closing Comments***

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This design manual is provided to guide the physical development of Mason's planned bicycle facility network. This manual is very comprehensive, but it does not address every design issue that could potentially arise. It does, however, address the most relevant design-related issues that are confronted by local governments when implementing a bicycle plan.

The illustrations and standards contained herein are largely based on AASHTO bicycle facility standards as found in the 1999 publication entitled *Guide for the Development of Bicycle Facilities*. Most illustrations were taken from the *Bicycle Friendly Manual* prepared by Edsall & Associates, LLC for Bike Miami Valley, Greene County Park District, the Village of Yellow Springs, and the City of Xenia.

Deviations from these, or other generally accepted bicycle design guidelines, are not encouraged unless there are unique conditions that are not addressed in the Design Manual or AASHTO publications. Deviations should be implemented only when the conditions warranting the change are clearly understood. Likewise, the impact that the deviation will have on bicycle safety should be thoroughly analyzed.



## **Appendix A**

### **Selected Road Characteristics**

| <b>Bicycle Facility</b>   | <b>Location</b>                                   | <b>Traffic Mix</b>             | <b>Speed Limit</b> | <b>Traffic Counts</b> | <b>Lane Width</b>                                                                                                                                                                                    | <b>Shoulder Width</b>                | <b>Shoulder Material</b> | <b>Number of Curb Cuts</b>            | <b>Appropriate Facility Design</b> | <b>Notes</b>                                                                                                                                     |
|---------------------------|---------------------------------------------------|--------------------------------|--------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------|---------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| S.R. 741                  | North of U.S. 42, south of Bethany Road           | Commercial and through-traffic | 50 m.p.h.          | 11,627                | 11'                                                                                                                                                                                                  | 2'                                   | Asphalt                  | Few, mostly industrial                | Bicycle/Pedestrian Path            |                                                                                                                                                  |
| S.R. 741                  | South of U.S. 42                                  | Commercial and through-traffic | 50 m.p.h.          | 12,068                | 11.5'                                                                                                                                                                                                | 4'                                   | Asphalt                  | Few                                   | Bicycle/Pedestrian Path            | One bridge crossing just south of U.S. 42.                                                                                                       |
| SR 741 (Kings Mills Road) | Parkside Drive to I-71                            | Commercial and through-traffic | 40 m.p.h.          | 16,883                | <u>Parkside Drive to Courseview Drive</u><br>14' outside lane<br><u>Courseview Drive to I-71</u><br>14' outside lane                                                                                 | 8' shoulder + 2' curb<br><br>2' curb | Asphalt                  | Few                                   | Bike Lanes; wide shoulders         | Overpass has 10' shoulder on both sides of bridge. Shoulders need widened between Courseview Drive and to the I-71 overpass.                     |
| U.S. 42                   | East of downtown to western edge of Heritage Park | Commercial and through-traffic | 25 to 40 m.p.h.    | 20,126                | <u>Mason-Montgomery Road to Fox Street</u><br>11.5' curb lane e.b.<br>14' + 8' for parking w.b.<br><u>Fox Street to Heritage Park</u><br>16' + 8' parking lane e.b.<br>12' + 11.5' parking lane w.b. | N/A                                  | N/A                      | Many, mostly residential              | Bicycle Lanes                      | On-street parking on east bound lane between Mason-Montgomery Road and Fox St.; both sides between Fox Street and Heritage Park.                 |
| U.S. 42                   | Western edge of Heritage Park to S.R. 741         | Commercial and through-traffic | 40 m.p.h.          | 12,777                | N/A                                                                                                                                                                                                  | N/A                                  | N/A                      | Few                                   | Bicycle Lanes                      | Pavement narrows at Heritage Park traveling from downtown. Lanes approximately 12' wide                                                          |
| U.S. 42 (Main Street)     | Downtown                                          | Commercial and through-traffic | 25 m.p.h.          | 20,522                | 12' + 2' curb                                                                                                                                                                                        | N/A                                  | N/A                      | Some, mostly commercial               | Bicycle Route                      | Inadequate lane width for bicycle lanes through Downtown Mason.                                                                                  |
| U.S. 42 (Reading Road)    | South of downtown to Fourth Avenue                | Commercial and through-traffic | 25 m.p.h.          | Not Avail.            | <u>First Street to Fourth Street</u><br>14' + 8.5' parking lane s.b.<br>16' + 8' parking lane n.b.                                                                                                   | N/A                                  | N/A                      | Many, mostly commercial               | Bicycle Lanes                      | One parking lane may need to be removed to provide adequate lane width to accommodate bicycle lanes.                                             |
| U.S. 42 (Reading Road)    | Fourth Avenue to Tylersville Road                 | Commercial and through-traffic | 25 m.p.h.          | 21,599                | 11' + 9' parking lane s.b.<br>16.5' lane n.b.                                                                                                                                                        | 2' shoulder<br>16" curb              | Asphalt                  | Many                                  | Bicycle Lanes                      | Both lanes need widening to accommodate bicycle lanes. One bridge crossing is located south of Tylersville Road.                                 |
| U.S. 42 (Reading Road)    | Tylersville Road to Western Row Road              | Commercial and through-traffic | 40 m.p.h.          | 15,720                | Lane widths and configurations vary depending on location                                                                                                                                            | Varies                               | N/A                      | Many                                  | Bicycle Lanes                      | Provide bicycle lanes and markings during next resurfacing or widening project. Bicycle lanes are important because of the 40 m.p.h speed limit. |
| Bethany Road              | West of Mason-Montgomery Road                     | Commercial and through-traffic | 35 m.p.h.          | 3,365                 | 11'                                                                                                                                                                                                  | 2'                                   | Asphalt                  | Many on south side, few on north side | Bicycle/Pedestrian Path            | Buildings are set back far from the road leaving adequate room for a separate path.                                                              |
| Bethany Road              | East of Mason-Montgomery Road                     | Light Commercial               | 35 m.p.h.          | 7,432                 | N/A                                                                                                                                                                                                  | N/A                                  | N/A                      | Few                                   | Bicycle/Pedestrian Path            | Buildings are set back far from the road leaving adequate room for a separate path.                                                              |

| <i>Bicycle Facility</i> | <i>Location</i>                                            | <i>Traffic Mix</i>                          | <i>Speed Limit</i> | <i>Traffic Counts</i> | <i>Lane Width</i> | <i>Shoulder Width</i> | <i>Shoulder Material</i> | <i>Number of Curb Cuts</i> | <i>Appropriate Facility Design</i>                         | <i>Notes</i>                                                                               |
|-------------------------|------------------------------------------------------------|---------------------------------------------|--------------------|-----------------------|-------------------|-----------------------|--------------------------|----------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <i>Mason Road</i>       | <i>West of Hickory Woods Drive</i>                         | <i>Light Commercial</i>                     | <i>35 m.p.h.</i>   | <i>4,876</i>          | <i>10'</i>        | <i>No shoulder</i>    | <i>N/A</i>               | <i>Few</i>                 | <i>Bicycle/Pedestrian Path</i>                             | <i>Buildings are set back far from the road leaving adequate room for a separate path.</i> |
| <i>Mason Road</i>       | <i>To Downtown</i>                                         | <i>Residential and through-traffic</i>      | <i>25 m.p.h.</i>   | <i>Not avail.</i>     | <i>10'</i>        | <i>No Shoulder</i>    | <i>N/A</i>               | <i>Few to Many</i>         | <i>Bicycle Lanes or Route; lanes will require widening</i> | <i>Numerous drive openings south of W. Church Street. Must move mailboxes back.</i>        |
| <i>Western Row Road</i> | <i>Between Kings Island Drive and Mason-Montgomery Rd.</i> | <i>Light commercial and through traffic</i> | <i>35 m.p.h.</i>   | <i>14,108</i>         | <i>12'</i>        | <i>0' to 1'</i>       | <i>Asphalt</i>           | <i>Few</i>                 | <i>Bicycle/Pedestrian Path</i>                             |                                                                                            |

Abbreviation Key

- e.b.* East Bound
- w.b.* West Bound
- n.b.* North Bound
- s.b.* South Bound

## **Appendix B**

### **Ohio Bicycle Laws**

## **Summary of Ohio Traffic Laws Relating to Bicycles**

A bicycle is defined (in section 4501.01) as a vehicle by the Ohio motor vehicle code. This means that the cyclist is bound to obey all traffic rules applicable to vehicles (section 4511.52). This includes riding on the right side of the road. Cyclists have "All of the rights and all the responsibilities."

### **4511.40 Hand and arm signals**

(B) As an alternative to division (A)(2) of this section, a person operating a bicycle may give a right turn signal by extending the right hand and arm horizontally to the right side of the bicycle.

### **4511.53 Rules for Bicycles, ...**

A person operating a bicycle or motorcycle shall not ride other than upon the permanent and regular seat attached thereto, nor carry any other person upon such bicycle...

No person operating a bicycle shall carry any package, bundle or article that prevents the driver from keeping at least one hand on the handle bars.

No bicycle or motorcycle shall be used to carry more persons at one time than the number for which it was designed and equipped...

### **4511.54 Prohibition against attaching bicycles and sleds to vehicles**

No person riding upon any bicycle, ...shall attach the same or himself to any ...vehicle upon a roadway.

### **4511.55 Place and manner of operating bicycles; riding bicycles and...**

- (A) Every person operating a bicycle upon a roadway shall ride as near to right side of the roadway as practicable obeying all traffic rules applicable to vehicles and exercise due care when passing a standing vehicle or one proceeding in the same direction.
- (B) Persons riding bicycles or motorcycles upon a roadway shall ride not more than two abreast in a single lane...

### **4511.56 Equipment of Bicycles**

- (A) Every bicycle when in use at the times specified in section 4513.03 of the Revised Code [when lights are required] shall be equipped with the following:
  - (1) A lamp on the front that shall emit a white light visible from a distance of at least five hundred feet to the front;
  - (2) A red reflector on the rear of a type approved by the director of public safety that shall be visible from all distances from one hundred feet to six hundred feet when directly in front of lawful lower beams of head lamps on a motor vehicle.
  - (3) lamp emitting red light visible from a distance of five hundred feet to the rear shall be used in addition to the red reflector;
- (B) ...equipped with a bell or other device giving a signal audible... 100 feet...
- (C) Every bicycle shall be equipped with an adequate brake when used on a street or a highway.

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