

# 2010 Bikeway Plan

City of Delaware, Ohio



CITY OF DELAWARE



# 2010 Bikeway Plan

## City of Delaware, Ohio

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# Executive Summary

This *Plan* builds upon the previous policy and planning documents adopted by the City of Delaware. The current Comprehensive Plan contains a number of goals and objectives related to bikeways, sidewalks, and pedestrian circulation systems. This 2010 Bikeway Plan incorporates those elements by reference and adds detail, priority and specificity to issues related to these issues.

## Highlights

- Pathway System totaled 15 miles (with another 3 Miles of Recreational Trails as well) in 2010, up from 8.5 miles in 2006
- Completed Trail Inventory utilizing Global Positioning System (GPS) technology
- Created Trail Inventory Layer in the City’s Geographic Information System (GIS) mapping system together with ownership, condition ratings, and other attribute data
- Added sidewalk information to GIS for complete pedestrian system identification
- Identified 5 major issues and recommended provided recommendations for each—(1) Maintenance; (2) Ponding and Flooding; (3) Bikeway Wayfinding; (4) Construction Standards; (5) Closing Gaps and Expanding the System
- Identified priority corridors, major system improvements, and system gaps including estimated costs and project constraints and considerations—there were 48 total projects identified by stakeholders totaling approximately \$3.2 million which would add almost 18 more miles of pathways, recreational trails, and sidewalks to the existing system
- Identified and Prioritized 10 major system improvements which would add approximately 4 miles of pathways at an estimated cost of approximately \$771,000



Priority Bikeway Projects		
Identifier Unique ID number	Bikeway name or priority areas (some may include multiple projects or phases)	Priority Agreement Percentage
113.010, 113.020	Houk Road: U.S. Highway 36 to State Route 37	95%
117.000	Olentangy Avenue: Henry to Sandusky streets	95%
124.012, 124.020	US 23 South: Wal-Mart/Kroger	71%
101.000, 102.000	Boulder Drive: Firestone Drive to Houk Road	71%
103.000	Bowtown Road Connector:SR 521 to the Point	71%
120.100	Springfield Branch: W. End to Firestone Drive	67%
122.000	Troy Road Smith Park Connector	38%
118.000	S Sandusky St (Existing Sidewalk Upgrade to Bikeway)	19%
112.000	Houk Rd.: Recreation Center to Boulder Drive	14%
129.000	Olentangy Ave (Connection to Stratford Rd.)	14%

The table above shows the top ten priority areas for new bikeways. .

## Policies

1. In order to become a truly sustainable city and to ensure a high quality of life for its citizens, the City is committed to completing an interconnected bikeway and pedestrian system consistent with the goals, objectives and strategies of the current Comprehensive Plan and the Recommendations of this Bikeway Plan.
2. The City will continue to plan for and implement a multimodal transportation system, while working on reducing reliance on the automobile for in-town trips wherever feasible.
3. All areas of the City will be connected to ensure safe pedestrian and bicycle access.
4. Future development will incorporate pedestrian-oriented systems and will facilitate walking and biking, including connectivity between developments and neighborhoods.
5. Priority will be given to maintenance of the current network followed by identified priority improvements that build upon the current system or complete missing segments that would connect nodes of activity, such as neighborhoods to recreational facilities, schools, and commercial centers like the downtown, or missing segments that would connect major existing portions of the pathway network.
6. Bikeway and pedestrian systems will be adequately maintained by the responsible party.
7. The City will establish clear, consistent, and reasonable construction standards that also allow for flexibility to account for site specific conditions, changing technologies, and fiscal considerations.
8. The City will include a maintenance budget and consideration for improvements within the annual Capital Improvement Planning process in order to maintain this City resource.
9. The City will utilize traditional funding mechanisms such as the general fund as well as grant sources and non-traditional funding sources in implementing these policies and goals while living within financial means.
10. The City will implement a Bikeway Wayfinding system consistent with the adopted Gateway & Corridor Plan and including Trail naming opportunities, route designation, and circuit identification.



## Conclusion

In 2005, the City had about 8.5 miles of bikeway. By 2010, the City had expanded to about 15 miles to the network, a 73 percent increase in trail-miles. This Plan identifies 5 primary issues and offers recommendations to address them. Implementation of these recommendations will result in extended infrastructure longevity, reduced lifespan maintenance costs, and a safer, more user-friendly bikeway network. Though there is a desire to expand the bikeway system, ignoring other issues may allow some problematic situations to persist which should be addressed as soon as possible, thus reducing long term costs for potentially expensive major repairs.

After adoption, City Departments with implementation control and authority, and City Council through policy and the budget process, should ensure that this Plan's recommendations are implemented on an ongoing basis. In order to expand the bikeway system and to ultimately build it out as envisioned connecting all areas of the City, specific capital improvement projects have been developed for consideration.

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# Chapter 1: Background and Policies

This Bikeway Plan builds upon policies, goals, and objectives adopted in the City's Comprehensive Plan as well as previous bikeway planning efforts. The goals of this plan are to create a detailed assessment of the bikeway/pedestrian network, formulate specific policy that can be used to implement the goals, and provide prioritization of needs for use in allocating resources to achieve a full system build-out and sustainable maintenance of the system over time. It is therefore, important to have an understanding of the policy and planning background and framework that has led to this plan. As a result of this background and the process used to develop the Bikeway Plan, a number of polices have emerged to help guide the City in its decision making as follows:

## ***Bikeway Plan Policies***

1. In order to become a truly sustainable city and to ensure a high quality of life for its citizens, the City is committed to completing an interconnected bikeway and pedestrian system consistent with the goals, objectives and strategies of the current Comprehensive Plan and the Recommendations of this Bikeway Plan.
2. The City will continue to plan for and implement a multimodal transportation system, while working on reducing reliance on the automobile for in-town trips wherever feasible.
3. All areas of the City will be connected to ensure safe pedestrian and bicycle access.
4. Future development will incorporate pedestrian-oriented systems and will facilitate walking and biking, including connectivity between developments and neighborhoods.
5. Priority will be given to maintenance of the current network followed by identified priority improvements that build upon the current system or complete missing segments that would connect nodes of activity (such as neighborhoods to recreational facilities, schools, and commercial centers like the downtown) or installing missing segments that would connect major existing portions of the pathway network.
6. Bikeway and pedestrian systems will be adequately maintained by the responsible party. For the City, this means a systematic, updated, prioritized, and adequately funded approach that is reviewed annually. In cases where private entities are responsible for maintenance the City will ensure this takes place including using enforcement mechanisms if necessary.
7. The City will establish clear, consistent, and reasonable construction standards that also allow for flexibility to account for site specific conditions, changing technologies, and fiscal considerations.
8. The City will include a maintenance budget and consideration for improvements within the annual Capital Improvement Planning process in order to maintain this City resource.
9. The City will utilize traditional funding mechanisms such as the general fund as well as grant sources and non-traditional funding sources in implementing these policies and goals while living within financial means.
10. The City will implement a Bikeway Wayfinding system consistent with the adopted Gateway & Corridor Plan and including Trail naming opportunities, route designation, and circuit identification.

## ***Comprehensive Plan 2003-2008***

In the Transportation Element of the *Comprehensive Plan 2003-2008*, the City's defined goal for transportation is stated as follows: "a multi-modal transportation system will be supported and

expanded that efficiently moves people and goods.” Expanding upon this broad goal, the Plan provides several supporting principals relevant to this Bikeway Plan (p.5.1-5.2):

1. The City will continue to plan for and implement a multi-modal transportation system, while working on reducing reliance on the automobile for in-town trips wherever feasible.
4. Alternative transportation modes will be supported, including transit service through DATA, commuter and light rail through COTA, and expansion of the bikeway network to link residential areas, schools and employment centers.
7. All planning subareas of the City will be connected to ensure safe pedestrian and bicycle access.
8. Future development will incorporate pedestrian-oriented design and will facilitate walking and biking, including extensive connectivity between developments and neighborhoods (cul-de-sacs will be discouraged).

The Plan goes on to detail Bikeways in the Biking Element, noting that the City is committed to developing an interconnected bikeway network not just for recreation but also as an alternative to the car for traveling throughout the City. A limited set of general standards is outlined in the plan and a benchmark of 3 miles of bikeways/ bike routes per year is set. The more specific objectives and strategies are contained within element T17 and T18 as follows:

**T17. Complete the *Bikeway Master Plan*.** The *Bikeway Master Plan* should be completed and presented to the Parks Board, Planning Commission, and City Council for adoption. The Recreation Services Department has an initial draft in place.

**T17.1 Complete Plan Late 2003 Parks & Recreational Services**

The Recreation Services Department will complete the *Bikeway Master Plan* as an implementation task following adoption of the Comprehensive Plan. It will be consistent with this plan relative to bikeway standards and locations. Once adopted, its provisions will be incorporated into the City’s development regulations where appropriate.

**T18. Continue Implementation of Bikeways.** Implementation of the *Bikeway Master Plan* should be continuous. The City has made great progress as noted above. The City should creatively use Federal and State grants, along with park impact fees, developer contributions, and general fund dollars to implement specific bikepaths.

**T18.1 Prioritize Projects Late 2003 Parks & Recreational Services**

The City establishes a priority of completing bikepaths along major arterials, with a secondary priority the completion of paths along major greenways as parkland becomes available.

**T18.2 Seek Additional Funds Ongoing Parks & Recreational Services**

The City continues to seek Federal and State grants to fund bikepaths, provided that grant administration requirements do not hamper implementation. In some cases, Federal and State requirements have been cumbersome and often create delays and project expenses that are excessive.

Finally, pedestrian connectivity is described in detail noting that people should have the option of driving, walking, or biking through the community without relying solely on major arterials. They should be able to safely travel from their neighborhood to another neighborhood, school, or retail center without necessarily using a major arterial. As development occurs, the reality is that the

sidewalk and bikeway system develops in an ad-hoc fashion, leaving gaps or unimproved segments between developments. Sometimes these gaps can be large, long, expensive segments and sometimes they can literally be only a few feet of gap that, if completed, would connect significant portions of the existing system. Therefore, in order to achieve the goals of the Plan, these gaps and missing segments need to be priority items for the City if it wishes to realize a completed network. The Plan sets out benchmarks for connectivity as follows (p.5.17):

1. A well-connected community in which pedestrians can safely travel.

The Objectives and Strategies to achieve pedestrian connectivity that are relevant to this Bikeway Plan are (p.5.18):

- T19. Continue to Promote Connectivity to Ensure a Walkable, Drivable Community.** Connectivity speaks to the ability of people to easily move among developments – whether in a vehicle, on a bike or on foot. Residential areas should be integrated so that people can easily travel among neighborhoods without having to use arterials. Commercial development should have links to residential areas so that people can easily and safely walk or ride. The same holds for schools and other civic places.
- T19.1 Linkages will continue to be strongly encouraged between existing and new residential developments, while strongly limiting the number of cul-de-sacs. Safe connections for walkers and bikers will also be provided.
  - T19.2 Sidewalks will continue to be required along all public streets. They will also be required along all private streets, including within multi-family developments, office complexes, and industrial parks.
  - T19.3 Commercial developments adjacent or near to residential areas will continue to be required to provide safe walking and biking connections.
  - T19.4 The City will inventory school sites with the school districts and identify missing sidewalk and/or bikepath links and provide a timeframe for construction. This study will be completed in 2004.
  - T19.5 The draft *Bikeway Master Plan* will be completed by the Recreation Services Department and presented to City Council for adoption in 2004, with a recommendation from the Parks Board. The Planning and Engineering Departments will provide assistance.
- T20. Promote Pedestrian-Oriented Development to Facilitate Safe and Efficient Walking.** Pedestrian-oriented development encourages walking and biking as alternatives to driving. It promotes connectivity and enhances the City's quality of life. The Downtown and adjacent historic neighborhoods promote walking because the densities are higher, the lots are narrower, there is a complete sidewalk system, and there are places to attract people (i.e. businesses, civic buildings, cultural facilities, etc.).

### **2005 Draft Bikeway Master Plan (note: this was never completed or adopted)**

To guide efforts to manage and expand the bikeway network, the Recreation Services Department of the City of Delaware began but never completed a *Bikeway Master Plan* in 2005. This plan began to establish goals and general design standards, as well as provide a list of proposed bikeways in and around the City of Delaware.

### 2007 city-wide trail inventory

Expanding on where the 2005 *Draft Bikeway Master Plan* left off, city departments led by Recreation Services and Planning & Community Development and including Public Works and Information Technology conducted an inventory of City pathways from November 2007 to April 2008. Trails were located, defined, and entered into the City's Geographic Information System (GIS) database in what has been the most comprehensive and detailed study of Delaware's recreational trail infrastructure to date. This basic data was essential to begin thinking about rekindling a Bikeway planning effort that could be meaningful, useful, and adoptable.

### 2010 Bikeway Plan

During completion of the inventory, the Planning and Community Development Department began the actual planning process leading to this current Bikeway Plan in large part to complete the following four tasks:

- Plan the results of the trail inventory, making current and reliable data about path conditions, attributes, and ownership available to City departments and decision makers.
- Provide analysis of the trail inventory data to identify issues affecting the system and offer research-grounded recommendations for how the City can respond.
- Present proposals for capital improvements to the bikeway network and several sidewalk infrastructure improvements that will improve access to the bikeway network. These proposals have been developed to facilitate project comparison and their inclusion in the City's Capital Improvement Program (CIP).
- Provide policies that could be adopted that would guide decision making for Bikeways and pedestrian ways into the future with the express purpose of maintaining the system, begin fiscally reasonable, and ensuring the long term goal of eventually building out the entire network desired by the community in a logical and strategic way.

*Plan* authors conducted research, performed analysis, and gathered stakeholder input to identify problems and opportunities, and make recommendations. These recommendations address challenges the City faces in its management of the bikeway network. In addition, this *Plan* offers proposals for future capital improvement projects aimed at expanding the network. Stakeholder input provided resulted in the prioritization of these capital improvement projects.

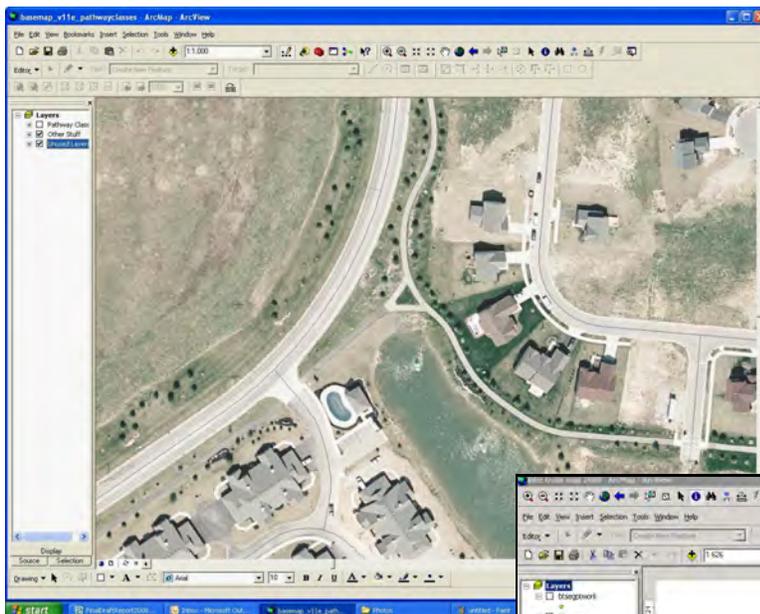
## Chapter 2: Pathway Inventory

The inventory and analysis section of this plan explain how the city conducted its inventory of existing bikeways as well as explains the methodology behind its analysis of existing infrastructure.

### Inventory Methodology

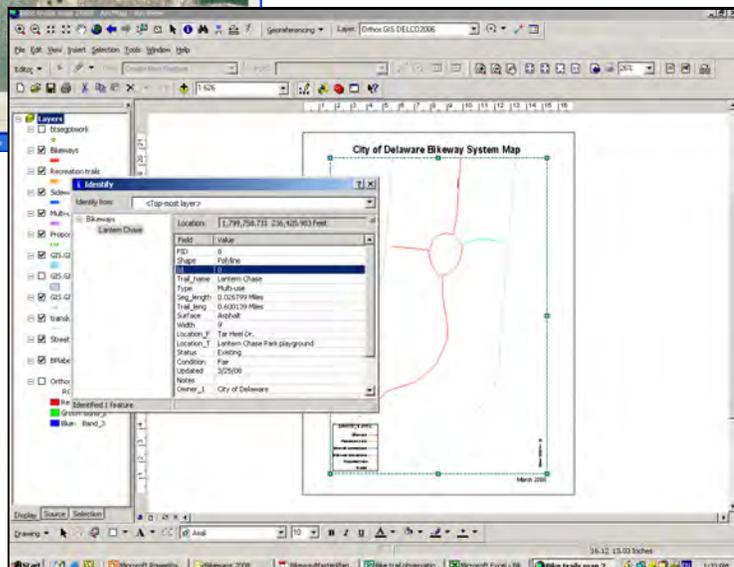
#### Locating the Existing Pathways:

The initial step of documenting the City's bikeways was to identify the locations of all existing trails. This was conducted using the 2006 aerial photography layer in the city's GIS database and field investigation. While most bikeways were visible from the air, others were found by walking along each path from start to finish to see if any additions had been made subsequent to those that appeared in the aerial photographs.



A screenshot of the City's ArcMap GIS (Geographic Information System) software displaying a portion of the 2006 aerial orthophoto used to locate city bikeways so that further fieldwork would record their exact location with a handheld GPS (Global Positioning System) locating device.

A screenshot of a previous version of the City's ArcMap GIS software displaying paths generated from location points recorded with the GPS device during fieldwork. Beyond their location, the software allows for other attributes such as fieldwork observations and other research to be recorded for each path. The digitization of these attributes will allow for a more detailed accounting of the condition and maintenance history of each bikeway.



### Recording the Data:

Once identified, field work was conducted to document the exact location of each pathway using a handheld Global Positioning System (GPS) device. Points were entered into the GPS device approximately every 25 feet, capturing an accurate representation of the location and curvature of the path. Physical characteristics such as length, width, surface material, condition, starting and stopping locations were also measured and recorded while in the field. These attributes were then entered into the City's ArcMap GIS database along with pathway ownership information derived from plats and development agreements. Entering the paths and their attributes into the GIS database will make it easier for city departments to record and update the information, ultimately allowing the network to be maintained more efficiently.

## Pathway Classification

### Methodology

In addition to bikeways, the 2008 trail inventory located a variety other types of paths throughout the city. These paths varied in width, surface material and length. Analysis of these paths resulted in four basic types.

### Bikeways (Multi-Use Trails)

- Hard surfaces, primarily asphalt
- 7 1/2' - 10 1/2' widths
- Usually extend over long distance
- Usually connect to other bikeways and paths

### Sidewalk Connections

- Hard surfaces, primarily concrete
- 3 1/2' - 6' widths
- Vary in length
- Connect bikeways to neighborhoods, schools, parks, and shopping centers
- Occasionally these are actually typical sidewalk sections that connect and are, therefore, part of the bikeway system

### Recreation Trails

- Soft surfaces such as compacted limestone or mulch, etc.
- Varying width
- Vary in length
- Primarily found in parks. Some trails have exercise equipment

### Multi-Use Connections

- Hard surfaces, usually asphalt
- 7 1/2'- 10 1/2' wide
- Path lengths generally short, usually connecting neighborhood parks to streets
- Constructed in private developments. Not planned as part of the city bikeway system but may provide useful connections to parks, shopping centers, streets, sidewalks, or bikeways.

# City of Delaware Bikeway System Map





## Bikeways (Multi-Use Trails)

Bikeways, also known as multi-use trails, generally parallel major roads and connect destinations in the city. These paths are mainly used for longer distance travel and to access other trails in the city, while ultimately creating a complete and cohesive bikeway system. The pavement widths of these trails generally range from 7 1/2 feet to 10 1/2 feet. Multi-use trails are constructed with asphalt, except in the case of the Cheshire Crossing Trail, which was built with concrete and is part of the sidewalk system in that development. In certain instances, bike trails have been routed along low volume streets or driveways. Bikeways are used by bikers, skaters, and pedestrians. While vehicular traffic is strictly prohibited on multi-use paths, golf carts are permitted on one section of the Cheshire Trail adjacent to the Glenross Golf Course.



Top: Springfield Branch Trail. Middle: Glenn Pkwy. Path. Bottom: a bikeway near Jaguar Spur Drive.



### Sidewalk Connections

Sidewalk connections are concrete or asphalt paths ranging from 3 1/2 to 6 feet wide. Sidewalks provide connections between bikeways and neighborhoods, schools, parks, and shopping centers. These paths often exist along streets where bikeways are proposed. In some situations, a multi-use trail may not need to be constructed, as the sidewalk is designated as the bike route.



Top: Six foot sidewalk along Firestone Drive. Middle: a cement path on Sapphire Flame Dr. Bottom: Asphalt path near Buehler's Market.



## Recreation Trails

Recreation trails are unpaved trails constructed with either gravel, crushed limestone, or mulch. These paths are further categorized as fitness trails, walking trails, or nature trails. Fitness trails such as the Mingo Trail in Mingo Park have exercise equipment beside them. Walking trails are found in parks such as the Stratford Woods Park Trail. These paths lack exercise equipment seen along fitness trails, but usually have benches or picnic tables alongside. Nature trails pass through designated conservation areas such as the Shelbourne Forest Nature Walk and the new wetland park trail.



Top: Mingo Trail at Mingo Park. Middle: Stratford Woods Park Trail. Bottom: Shelbourne Forest Nature Walk.



## Multi-Use Connections

Multi-use connections are asphalt paths ranging from 7 1/2 feet to 10 1/2 feet wide. These trails are similar to the bikeways in width and surface material; however typically connect neighborhood parks with local streets when a row of houses separates the two. The majority of these connectors are constructed by developers in newer neighborhoods. Multi-use connections may also serve to improve access to neighborhoods, shopping centers, schools and parks. Though most stand alone, it may be possible (and in some cases has already been done) to incorporate some of these paths as a part of the bikeway system. In many cases these are difficult to distinguish from Bikeways (Multi-Use Trails), however a point of distinction can be when these are private and lacking public easements.



Top: A park connection near Ashburn Drive.  
 Middle: A path leading through Smith Park. Bottom:  
 A connection leading into Stratford Woods Park.

## Chapter 3: Major Issues & Recommendations

Five system wide major issues were identified:

- I. Insufficient and inconsistent approach to performing and funding bikeway **MAINTENANCE**,
- II. Multiple instances of potentially hazardous prolonged **PONDING AND FLOODING** of water on bikeways,
- III. Lack of a **BIKEWAY WAYFINDING SYSTEM** that is consistent, clear, and coordinated,
- IV. Lack of official **STANDARDS** for new pathway construction by path type, function, and location, and
- V. **CLOSING GAPS AND EXPANDING THE SYSTEM**

The problems identified represent a range of issues from addressing safety on the system to improving the lifespan of pathway facilities to improving the quality of recreational experience for system users and completing the planned system.



Mingo Trail bikeway along the Olentangy River.

## I. Maintenance

Efforts to maintain city bikeways are hampered by several issues, including:

- There has been confusion over matters of pathway ownership, leading to some pathways not being maintained.
- No condition standard has been established by the City nor has a formal policy or goal been established for ensuring minimum maintenance standards. Sections that flood or have large cracks or pavement projections can be hazardous for cyclists. Establishing a condition ranking system that would then lead to a set of recommendations for what would be allowable limits for these defects or at least would set a goal for maintenance at a certain condition rating is recommended. (Condition Standards: see Appendix C).
- Inspections of pathways have not been conducted on a regular basis, limiting the City's ability to identify hazards and track degradation of pavement conditions on an ongoing basis. The last inspection occurred in 2006. Regular inspections are necessary identify new hazards, accessibility concerns, as well as track pavement deterioration.
- Though the city has engaged in preventative maintenance activities, a preferred sealer product and application schedule has not been identified nor consistently funded. Between 2006 and 2008, three different products have been applied at irregular intervals (See Appendix A).
- The \$5,000 budget used for bikeway sealing has not increased in the past four years despite a near doubling of the contract price of applying sealer and a 73 percent increase in trail miles since 2005.
- Beyond the need for preventative maintenance, progress is slow toward addressing other pathway problems. The inventory revealed some paths had missing signs, graffiti, potholes, sinkholes, and general pavement deterioration. It will ultimately cost much more to replace these segments than to properly maintain them and liability of unmaintained paths is also a concern.
- Staffing levels, work loads, work flows, and budget constraints have all hampered the City's ability to inspect bikeways, track conditions and new segments, and perform regular maintenance.



Poor pavement near Muirwood Village Apartments



Graffiti spray painted on a City bikeway.

### Goal

Maintain the City's bikepath network to an established standard in order to ensure the safety of users, minimize long term replacement costs, maximize the useful lifespan of facilities, and ensure the funding of pathway maintenance.

### Policies

- i. Priority will be given to maintenance of the current network followed by identified priority improvements that build upon the current system or complete missing segments that would connect nodes of activity (such as neighborhoods to recreational facilities, schools, and commercial centers like the downtown) or installing missing segments that would connect major existing portions of the pathway network.
- ii. Bikeway and pedestrian systems will be adequately maintained by the responsible party. For the City, this means a systematic, updated, prioritized, and adequately funded approach that is reviewed annually. In cases where private entities are responsible for maintenance the City will ensure this takes place including using enforcement mechanisms if necessary.
- iii. The City will include a maintenance budget and consideration for improvements within the annual Capital Improvement Planning process in order to maintain this City resource.

### Recommendations

- Maintenance - 1: Establish a pathway Condition Standard defining minimum maintenance standards based on common hazards. Such a standard would apply to all pathways regardless of who owns and maintains the path.

- Maintenance - 2: Research, compare, and choose a preventative maintenance product, standard, and implementation strategy that is economical viable for the City to employ toward preserving City-owned pathways.
- Maintenance - 3: Review ownership and maintenance responsibility for all sections of pathways. Notify and hold responsible private path owners of their ownership and maintenance responsibilities.
- Maintenance - 4: Implement an annual inspection program of all pathways citywide. Inspections should utilize the Condition Standard adopted by the City and result in the creation of an annual report from the data which will be tracked in the GIS mapping files. This report should detail: 1) the condition of every section of bikeway in the city, 2) the physical location and a description of all emergency and non-emergency repairs that need to be made or have been made over the previous year, and 3) a description of how the City will work to improve the situation and/or its condition priority ranking.
- Maintenance - 5: Emergency maintenance repairs and the pathways rated poor or below should take priority in funding and implementation. Until serious hazards are repaired, the City should consider using warning signs to advise users of the potential hazard.
- Maintenance - 6: Implement a program to seal all identified city paths at one time every year. Such a program would be a portion of the City's CIP budget and ensure all paths are sealed with a high-volume cost effective contract.



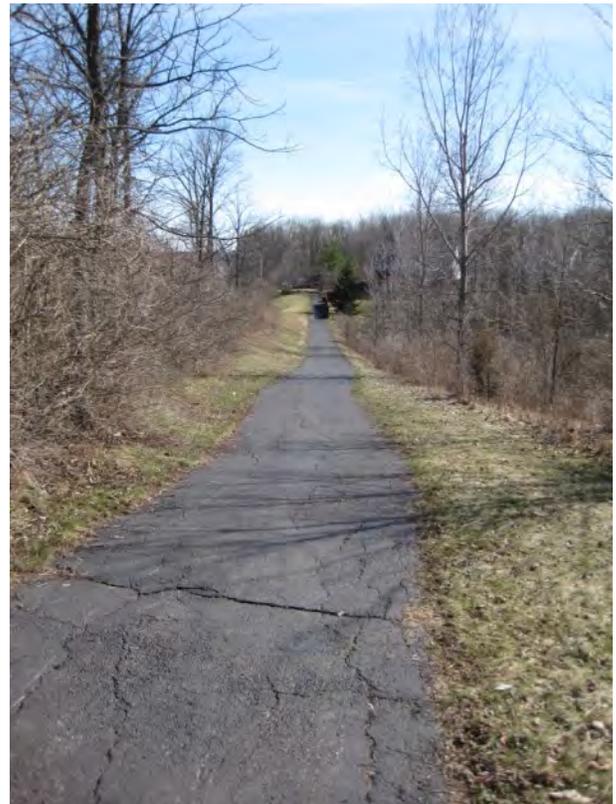
Left: A gravel path leading from a sidewalk into Stratford Woods Park has experience significant erosion and is most likely inaccessible. Right: An improved, ADA compliant crossing and path replaced the eroded path leading into Stratford Woods Park.

## Chapter 3: Major Issues & Recommendations

- Maintenance - 7: Establish a maintenance budget to cover other preventative maintenance repairs identified as well as include an annual set-aside for emergency maintenance.
- Maintenance - 8: Consider grouping new paving and pavement sealing projects with other municipal and private projects to take advantage of high-volume or private sector pricing.
- Maintenance - 9: Identify and utilize grant sources and partnerships to reduce costs as much as possible.
- Maintenance - 10: Identify non-traditional funding sources for maintenance. For example Adopt-a-Path, trail sponsorship, volunteer groups, or allow advertising along paths.
- Maintenance - 11: Consider requiring developers to make a one time contribution specifically for maintenance of the bikeway system and/or require developers to maintain paths for a minimum period of time after they are installed and accepted/approved. Today, other public improvements are subject to a 2 year maintenance bond period after acceptance of the improvement.



On-going deterioration of paths that might have been prevented or might not have occurred as quickly in the path life cycle without on-going maintenance.



## II. Ponding and Flooding

While potentially part of the Maintenance Issue, flooding issues were prevalent enough and pose such a potential hazard as well as maintenance cost that this issue has been separated from the Maintenance Issue. Additionally, careful preconstruction specifications, construction, and rigorous field inspections will eliminate as much of this issue upfront as can reasonably be expected.

While flooding may be tolerable for brief periods and/or for certain pathway segments designed to withstand flooding, prolonged flooding can result in the accumulation of slime and algae on a bikeway surface in addition to the standing water and it usually represents a larger drainage problem in the area that needs to be corrected. This situation can create a very slippery surface, threaten the safety of bikers and pedestrians, and be an unexpected hazard encountered frequently at high speed by users of the pathway.

In most instances, prolonged flooding is the result of poor drainage where trails parallel slopes, cross shallow ditches, or they were built on ground that has settled. In addition to being a threat to user safety, these conditions result in increased maintenance costs to correct premature deterioration of that section of the path or, worse yet, complete reconstruction.

### Goal

Ensure that ponding and flooding of pathways is highly prioritized in identification and maintenance activities and ensure that new pathways are built with an eye to eliminating future ponding and flooding problems.

### Policies

- i. All areas of the City will be connected to ensure safe pedestrian and bicycle access.



An example of a path that was constructed through a shallow ditch, allowing water to collect on a section of the Lantern Chase Trail at Jaguar Spur Drive.

## Chapter 3: Major Issues & Recommendations

- ii. Bikeway and pedestrian systems will be adequately maintained by the responsible party. For the City, this means a systematic, updated, prioritized, and adequately funded approach that is reviewed annually. In cases where private entities are responsible for maintenance the City will ensure this takes place including using enforcement mechanisms if necessary.
- iii. The City will establish clear, consistent, and reasonable construction standards that also allow for flexibility to account for site specific conditions, changing technologies, and fiscal considerations.
- iv. The City will include a maintenance budget and consideration for improvements within the annual Capital Improvement Planning process in order to maintain this City resource.

### Recommendations

- Ponding & Flooding - 1: Inspect city bikeways during a time of the year when these kinds of hazards will be present (e.g. during the spring).
- Ponding & Flooding - 2: When such a hazard is found, utilize temporary signage to warn bikeway users until it can be fixed. Permanent signage should be used in places designed for such events.
- Ponding & Flooding - 3: Encourage collaboration between the Engineering, Public Works, Parks and Recreation, and Planning and Community Development to identify and fix these sections of bikeway. A single lead entity should be designated for this responsibility to ensure that it gets done.
- Ponding & Flooding - 4: Estimate costs and program projects into the Capital Improvement Program (CIP). Should they be identified as immediate hazardous by an inspector, such a repair should occur as quickly as possible.
- Ponding & Flooding - 5: Identify and utilize grant sources and partnerships as much as possible.
- Ponding & Flooding - 6: Require developers and private entities to fix problems which are a result of overall drainage issues adjacent to a pathway.
- Ponding & Flooding - 7: Ensure rigorous inspection during construction of pathways by developers and private entities to ensure that drainage issues are taken into account with respect to the pathways.
- Ponding & Flooding - 8: Require a maintenance period after installation and/or acceptance of a pathway which has been constructed by a developer or private entity that specifically addresses drainage issues that might come up as a result of ground settling, poor workmanship, or lack of sufficient drainage devices. (See Maintenance Issues Recommendations).

### III. Trail Wayfinding

Most city bikeways currently have no signage at all. However, several of the newest paths have an over-abundance of traffic control signage installed. Needless to say, there is no wayfinding system installed today. Such a system would use bikeway design, naming, and signage to help users identify where they are, the name of the path they are on, and information on how they could get to popular destinations throughout the city. Additionally, traffic control signage, while necessary, should be minimized as much as possible. Efforts to name paths, provide maps, and erect directional signs and system maps are pointless without a corresponding system deployed in the real world. Such a system will make it easier for users to get around, especially for those who may be unfamiliar with the system such as town visitors, new residents and the city's youth. The City's Gateway & Corridor Plan (GCP) contains coordinated signage and wayfinding for bikepaths. While the GCP has been implemented successfully in developments, it has been ignored in development of bikepaths to date. This should change to help create a comprehensive, clear, and complete wayfinding system, not just traffic control devices that may be required along pathways. For example, there are no pathway identification signs. Thus, any trail map, educational materials, marketing material, or even sponsorship opportunities do not exist that can actually be coordinated in the real world along the trails themselves. This is a huge missed opportunity for the City and leaves the pathway system incomplete as a result. Examples of bikeway signage are provided in Appendix F.

#### Goal

Implement a clear, consistent, and comprehensive wayfinding system for the pathway network using the adopted Gateway & Corridor Plan design elements, the path typologies from the Bikeway Plan, the recommendations of the Bikeway Plan, and, where required, minimal traffic control signage.

Low traffic volume streets and service roads have been designated as bikeways in several places, however, no signage or striping exists in many cases to indicate the continuation of these paths. Pictured above, the south end of a path along S. Sandusky Street which dead-ends into a cul-de-sac on Winston Drive of which cyclists must ride south on until they may continue south on a second bikeway.





Examples of path markings that indicate the continuation of the bikeway.



### Policies

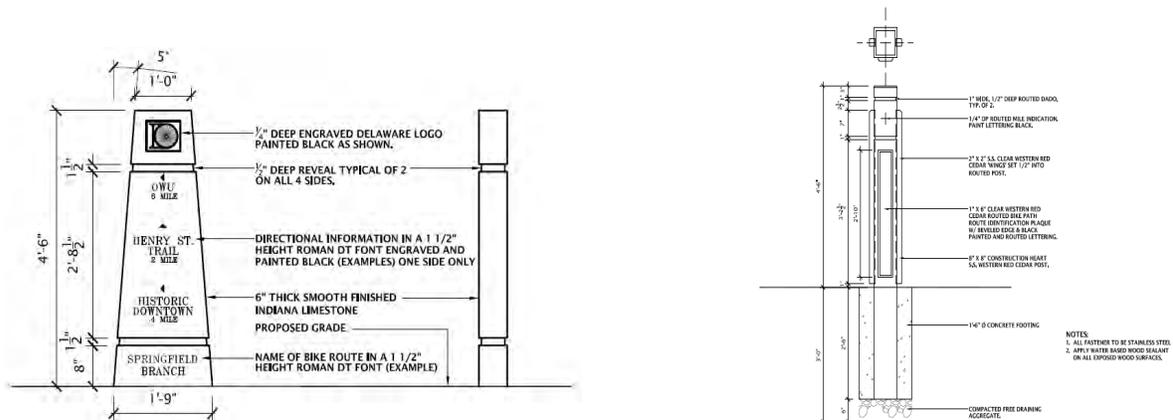
- i. In order to become a truly sustainable city and to ensure a high quality of life for its citizens, the City is committed to completing an interconnected bikeway and pedestrian system consistent with the goals, objectives and strategies of the current Comprehensive Plan and the Recommendations of this Bikeway Plan.
- ii. All areas of the City will be connected to ensure safe pedestrian and bicycle access.
- iii. Future development will incorporate pedestrian-oriented systems and will facilitate walking and biking, including connectivity between developments and neighborhoods.
- iv. The City will implement a Bikeway Wayfinding system consistent with the adopted Gateway & Corridor Plan and including Trail naming opportunities, route designation, and circuit identification.

### Recommendations

- Trail Wayfinding - 1: Implement the *Gateway & Corridor Plan* bikepath wayfinding recommendations.
- Trail Wayfinding - 2: Develop a detailed branding scheme for the trail system in Delaware.
- Trail Wayfinding - 3: Consider a wayfinding Trail Identification Sign scheme that allows room for these signs to contain sponsorship naming that can be changed easily but still is of high design quality. Implement an adopt-a-trail like system to procure naming sponsors to help off set maintenance costs.
- Trail Wayfinding - 4: Establish standards for signage consistent with the *Gateway & Corridor Plan* that identify paths and direct path users while reducing the over abundance of traffic control signs that exist on some

segments. Signs should be attractive and resistant to vandalism and theft.

- Trail Wayfinding - 5: Utilize pavement markings where possible as an alternative to free standing signs especially for traffic control devices.
- Trail Wayfinding - 6: Name and, perhaps, color code individual trails. Identify pathways that create circuits or loops to encourage these to be used to enhance the health of the community by facilitating exercising on these pathways.
- Trail Wayfinding - 7: Consider the use of signs to indicate where trails end. This signage could be used to inform users of future expansion plans and could be similar to the signage used at stub streets in subdivisions today.
- Trail Wayfinding - 8: Publish a map of current and future bikeways and parks in and immediately surrounding the City of Delaware.
- Trail Wayfinding - 9: Add mile markers (and partial mile markers) to trailway system so users know how far they have gone from a certain point. The beginning points will have to be standardized in order to ensure that the overall number of signs is minimized and in order to maintain some organization to the overall system for users.



Examples of the Gateway & Corridors Plan trail markings and bollards.

An example of using signs without pavement markings to denote path location and direction.



## IV. Construction Standards

Subdivision regulations, development agreements, and exactions have been instrumental in the expansion of the City's bikeway network over the past decade. Though regulations required the installation of paths, today the city has a variety of paths that differ in width and perhaps even material and construction standards.

This plan recommends establishing a construction standard for public and private projects that will be contributed to the City's bikeway network. Standards are needed to ensure common path characteristics and quality workmanship. The legacy of poorly constructed or designed paths will require additional maintenance and even premature replacement, placing a financial burden on the City's ability to maintain the bikeway network. Engineering and design specifications implemented now and consistently enforced will have a lasting impact in reducing problems that affect paths in the system today including path flooding, premature cracking of pavement surfaces, and instances of surface projections.



This section of path between Barberry Spur and Timbersmith (left) drives is less than three years old and is already showing signs of pavement deterioration. The application of herbicide or the laying of a geotextile fabric could help to prevent instances of weeds that may eventually grow through these cracks such as in this example (right) on a path near Hawthorn Boulevard.



This is an example of a ramp that has been installed for path users. The ramp, on Jaguar Spur Avenue is about half the width of the bikeway it provides access to and it does not have a detectable warning pad. At the crossing, there are no warning signs or pavement markings for automobile drivers. The curb is also already deteriorating.

### Goal:

The City will establish reasonable construction standards by trail type and location/application that are cost effective to build and provide a long term useful life with low maintenance costs and that address attributes such as pavement width and surface materials, as well as specific engineering standards for pathway construction that are consistently enforced.

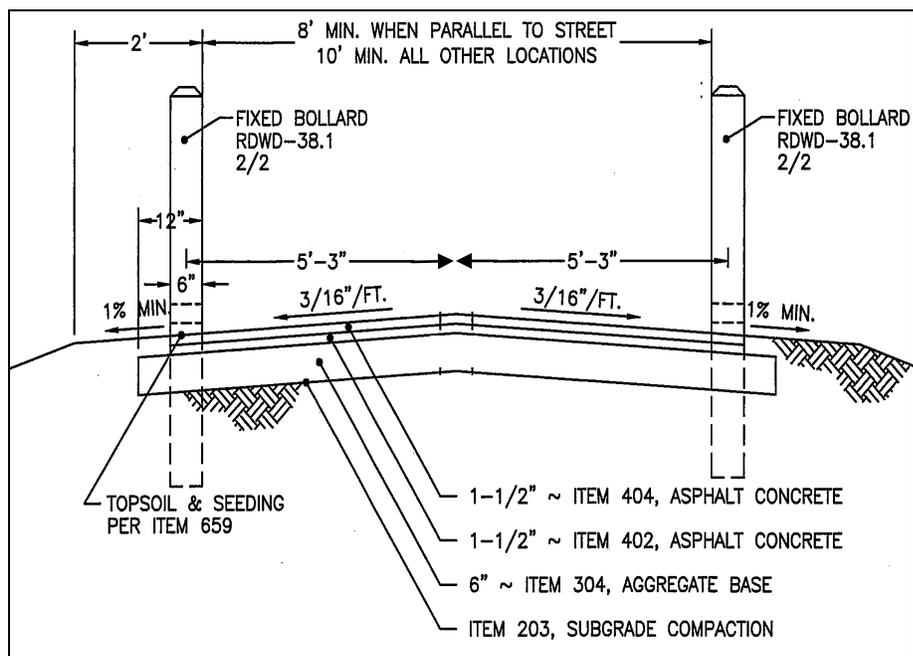
### Policies:

- i. The City will continue to plan for and implement a multimodal transportation system, while working on reducing reliance on the automobile for in-town trips wherever feasible.
- ii. Future development will incorporate pedestrian-oriented systems and will facilitate walking and biking, including connectivity between developments and neighborhoods.

- iii. The City will establish clear, consistent, and reasonable construction standards that also allow for flexibility to account for site specific conditions, changing technologies, and fiscal considerations.
- iv. The City will implement a Bikeway Wayfinding system consistent with the adopted Gateway & Corridor Plan and including Trail naming opportunities, route designation, and circuit identification.

**Recommendations:**

- Construction Standards - 1: Bikeways will have a preferred pavement width of 8 to 10 feet where practical.
- Construction Standards - 2: City and private improvements to the bikeway network are required to be constructed according to specifications defined by the City’s Engineering Department consistent with the Zoning Code and this Bikeway Plan. Such a requirement should be codified.
- Construction Standards - 3: Paths should be built in accordance with applicable law, notably ADA accessibility standards. Curb cuts, ramps, and detectable warning pads should be positioned and appropriately sized for making City bikeways accessible.
- Construction Standards - 4: Incorporate wayfinding signage as a required component for City and developer contributed sections of new bikeway. These contributions should be of the same quality, design and style as the system standard as determined by the City of Delaware and noted elsewhere in this Plan.



The engineering drawing to the left is an example of what a Bikeway construction standard could look like. The current standard should be certified by the City’s Engineering Department and city code should recognize the most recent Engineering Department standard as the standard by which public and private contributions to the path system would be built to or payment’s made instead. All potential pathway types should be accounted for with construction drawings and standards.

- Construction Standards - 5: Paths should be constructed in such a way as to not be susceptible to flooding. Bikeways should be elevated pathways above ditches and depressions, utilizing pipe culverts to allow cross-path water flow. Stormwater should not be permitted to sheet flow across a bikeway for known watercourses, swales, and the like.
- Construction Standards - 6: The use of pathway edging should be considered as a method to help prevent asphalt from cracking along its edges, leading to premature deterioration of the asphalt path.
- Construction Standards - 7: The use of an herbicide or the installation of a geotextile fabric between the path base and asphalt layers should be considered as possible technique to help prevent the growth of weeds through cracks in pathway.
- Construction Standards - 8: Monetary contributions from developments toward satisfaction of Code requirements should be made based upon the standards set per the type and application of the bikeway and should not be arbitrarily enhanced or reduced on a case by case basis as these funds are then relied upon to complete missing pathway segments.
- Construction Standards - 9: Require a maintenance period after installation and/or acceptance of a pathway which has been constructed by a developer or private entity and enforce repairs or even reconstruction of sections that are found to be deficient.



Construction standards should include bridges for pathways, crushed stone paths and other non-traditional applications.



## V. Closing Gaps and Expanding the System

The City's bikeway network has grown over the past decade, resulting in a total of 14 miles of path distributed throughout the city. This occurred as a result of subdivision regulations that required bikeways to be constructed as a part of new development. Though the policy has helped add system miles, it has resulted in gaps in the bikeway between developed parcels. Though many of these gaps may eventually be developed, many others are single-family homes and are unlikely to be developed in the short to medium term. Closing these gaps is a necessary component of improving and growing the City's bikeway network. This is especially true when a gap represents the "last gap" in an area of the network that would connect nodes of activity, complete circuits / loops, or result in completions of entire sections.



This aerial photograph displays the locations of constructed bikeways (red) and sidewalks (blue). Between this infrastructure, several gaps exist along Cheshire and Old Cheshire roads. Though development in the area has constructed a majority of the bikeway, gaps exist along the frontage of single family homes and other parcels that may be unlikely to be developed. Additionally, because gaps remain several sections are basically unusable yet they are deteriorating and are a maintenance burden.



Some developer-contributed bikeways end within inches of telephone poles, gas regulators, telecommunication and electric boxes. In order to extend the bikeway, the path would either need to be routed around the utility boxes or the utilities would have to be relocated. The photo and aerial orthophoto

This Bikeway Plan has identified and proposed a comprehensive list of proposed bikeway corridors as a long-range goal for the City. As a part of this *Plan*, near and mid-range projects were mapped in GIS and prioritized by stakeholders. Project benefits and rough cost estimates (including larger potential issues for each) were generated for each proposed improvement. This information should be helpful in guiding bikeway expansion plans in the near-term and helped with prioritization.

Some projects are very simple and require less than 50 linear feet of pavement, while other improvements are very long, requiring over a mile of improved bikeways. For the purpose of this plan, "gaps" were defined as segments of less than 660 feet (1/8 mile) in length that, if built, would allow for a much longer contiguous segment of path. Improvements of longer than 660 feet have been called "expansions" and generally represent projects that are more expensive. If it seemed logical, projects were broken up into different phases with each phase being described as a "gap" or "expansion" based solely on its length.

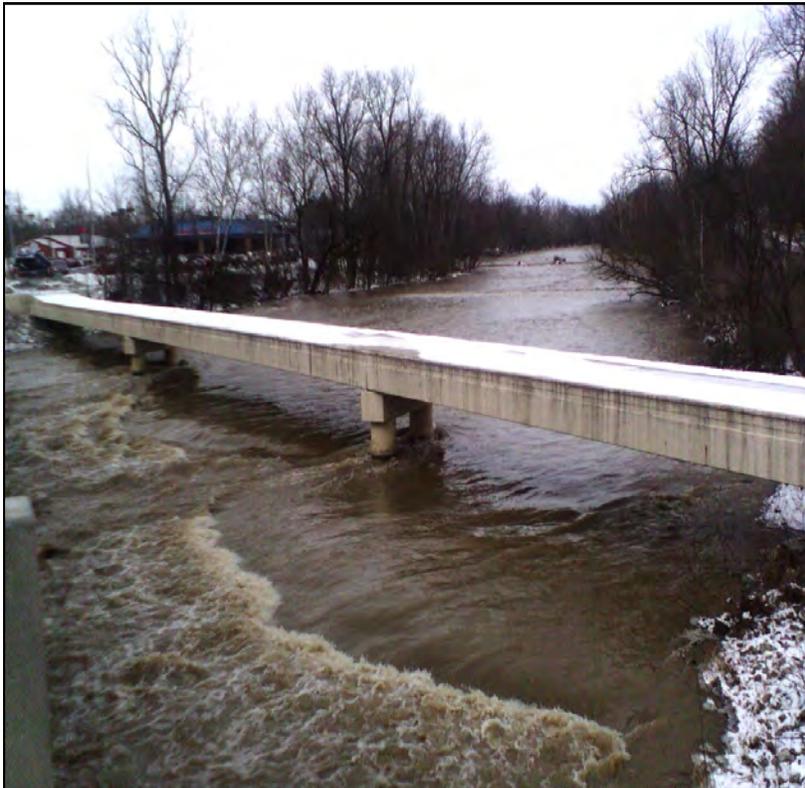
Generally:      Gaps                = 660 ft. or less (1/8<sup>th</sup> of a mile)  
                          Expansions       = 660 ft. or more

### Goal

The City will build out the proposed bikeway network through prioritized, budgeted, improvements that are reviewed on a regular and consistent basis while focusing on improvements that complete existing circuits / loops, connect nodes of activity, or provide needed alternative transportation routes.

### Policies

1. In order to become a truly sustainable city and to ensure a high quality of life for its citizens, the City is committed to completing an interconnected bikeway and pedestrian system consistent with the goals, objectives and strategies of the current Comprehensive Plan and the Recommendations of this Bikeway Plan.
2. The City will continue to plan for and implement a multimodal transportation system, while working on reducing reliance on the automobile for in-town trips wherever feasible.
3. All areas of the City will be connected to ensure safe pedestrian and bicycle access.
4. Future development will incorporate pedestrian-oriented systems and will facilitate walking and biking, including connectivity between developments and neighborhoods.
5. The City will utilize traditional funding mechanisms such as the general fund as well as grant sources and non-traditional funding sources in implementing these policies and goals while living within financial means.



A sewer utility bridge constructed over the Olentangy River at U.S. Highway 23 was constructed to be easily converted into a bikeway bridge. This will greatly reduce the cost of connecting southeast Delaware to the rest of the city and contribute to the long-range goal of connecting the city to a regional path that extends into southern Delaware County and eventually to the City of Columbus.

**Recommendations – This Issue and its recommendations below are detailed further in Chapter 4 and the appendix.**

- Gaps and Expansions - 1: Prioritize system gaps and improvements that complete circuits, make longer paths, or connect major activity nodes including 2 or more neighborhoods.
- Gaps and Expansions - 2: Require the coordination of utility, roadway, and bikeway improvements during the planning process to allow for mutual accommodation at installation.
- Gaps and Expansions - 3: Require that any utility installations and relocations do not block or impede the ability to complete or expand bikeway sections through coordinated pre-installation plan review consistent with this Plan, requiring existing impeding utilities to be relocated, and through rigorous inspections in the field during and after utility construction.
- Gaps and Expansions - 4: Expand and improve sidewalks and crosswalks to improve connections between bikeways and neighborhoods, schools, shopping centers, parks, and downtown.
- Gaps and Expansions - 5: Make major system expansions where they would connect the most users to the highest activity nodes. This may include budgeting for these improvements over multiple years until sufficient funds exist to proceed with the project.
- Gaps and Expansions - 6: Implement wayfinding recommendations and construct these improvements when working to close system gaps.
- Gaps and Expansions - 7: Ensure that new development contributes bikeway sections that close gaps where possible. Developers should be required to connect their bikeway contributions to existing bikeways on adjacent or nearby property if necessary.
- Gaps and Expansions - 8: Developers should be required to work with city staff to determine where path contributions should be built as a part of the site planning process or if a general payment in lieu of construction is more logical and desirable.
- Gaps and Expansions - 9: Program priority gap improvements into the Capital Improvement Program annually, utilizing grants and partnerships as much as possible.



When completing projects that are not primarily pathway projects, such as the culvert project to the left that included pathway installation, it is important to account for utility relocations that may impact future pathway extensions.

- Gaps and Expansions - 10: Ensure that the City’s system is planned in a way to be integrated into the County pathway system and even into the regional system. This is very important for areas at the edge of the city where development should be connected regardless of jurisdictional boundaries.
- Gaps and Expansions - 11: Update the bikeway GIS Mapping inventory as segments are added and double check accuracy of these files annually to ensure their viability and reliability.
- Gaps and Expansions - 12: Critical sidewalk connections, on-street bike lanes, and other ‘shared’ resources should be considered in areas that are already developed for situations that would provide immediate connectivity between nodes or close gaps and where no other viable (technical or financial) options exist. These non-traditional applications must be balanced against safety considerations, financial costs / benefits, and what makes reasonable sense from a typical user’s point of view (visual routes or shortest routes of travel for example).
- Gaps and Expansions - 13: Monetary contributions by developers shall not be confined to a certain section of pathway, but rather shall be used at the discretion of the City for priority pathway improvements and closure of existing pathway gaps in the network. These improvements should be annually planned and coordinated as described elsewhere in this document.

<b>Bikeway Gap Network Improvements</b>						
(In order of increasing length)						
<b>Identifier</b>	<b>Bikeway name, priority area</b>	<b>Priority</b>	<b>Region</b>	<b>Length (feet)</b>		<b>Cost</b>
<b>UIDN</b>	<b>Bikeway Segments</b>	<b>(vote %)</b>		<b>Paved</b>	<b>Total Path</b>	<b>(estimate)</b>
106.000	Cheshire Road Bikeway Gap (#2)	5%	SE	37	90	\$1,609.50
126.000	US 36 at Lehner Woods Blvd Gap	5%	SW	48	48	\$2,088.00
105.000	Cheshire Road Bikeway Gap (#1)	0%	SE	304	304	\$13,224.00
107.000	Cheshire Road Bikeway Gap (#3)	5%	SE	438	500	\$19,053.00
108.000	Cheshire Road Bikeway Gap (#4)	5%	SE	475	475	\$20,662.50
119.000	Springfield Branch Bikeway: East gap (End - E. Central)	5%	NE	480	560	\$20,880.00
117.000	Olentangy Avenue (Washington Sq.; Henry - Sandusky)	95%	C	520	574	\$22,794.00
102.000	Boulder Dr. (Houk to Harmony Drive)	71%	SW	570	570	\$22,880.00
104.000	Carson Farms Connector	5%	SW	655	660	\$28,492.50
<b>Identifier</b>	<b>Sidewalk Connector name, priority area</b>	<b>Priority</b>	<b>Region</b>	<b>Length (feet)</b>		<b>Cost</b>
<b>UIDN</b>	<b>Sidewalk Connector Segments</b>	<b>(vote %)</b>		<b>Paved</b>	<b>Total Path</b>	<b>(estimate)</b>
2.000	Liberty Road Sidewalk Gap (S.O. of Belle Ave)	0%	C	257	293	\$8,995
6.000	SR 521 Sidewalk Gap (S.O. Bowtown Rd)	0%	NE	564	733	\$19,740
5.000	Schultz Elem. Sidewalk Expansion (south: north)	10%	SW	587	587	\$20,545

This table shows gaps identified by the trail inventory in order of increasing length. For the purposes of this *Plan*, gaps are defined as missing segments of path that connect two or more existing trails and are less than 660 feet (1/8 mile) long.

Gaps and Expansions - 14: Review and revise relevant City ordinances to ensure that bikepaths are allowed where desired (such as downtown and on sidewalk sections) and the safety of all users is ensured. (see appendix).



Not only is this a potential utility conflict issues but also this is the gap along the US23 pathway between Stratford Woods subdivision and the Delaware Plaza shopping center in front of Wendy's restaurant. If one looks closely the tire tracks of bicycles are evident in the mud to the left of the utility box. This gap is maybe 20 ft. total but finding the right connection is critical to being able to direct pathway traffic across this busy center.

Another example of a pending utility problem as this utility pole is located in the middle of the pathway about 2 feet in front of the path.



# Chapter 4: Bikeway Improvements

## Project Development Methodology

### Evaluating Existing Infrastructure

The completion of the trail inventory provided the basis for determining where future improvements should be located. These improvements include the closing of gaps between existing segments and strategic expansions of the system to allow for cross-city bikeway connectivity. The map on page 29 shows existing bikeway and sidewalk infrastructure.

### Proposed Improvement Identification

Short and near-term projects were identified in this *Plan* as a starting point for achieving long-range goals. These projects were selected because they address one or more of the following goals:

- Close a gap between two or more segments of bikeway.
- Expand the network to create longer, continuous segments of bikeway, especially those that may allow cross-city travel and create circuits.
- Create a link between neighborhoods and schools, shopping centers, the Downtown, and recreation facilities such as Smith and Mingo parks and the Future YMCA Recreation Center.



The end of a bikeway at the corner of W. William Street and Grand Circuit Boulevard.

# Existing Infrastructure Map

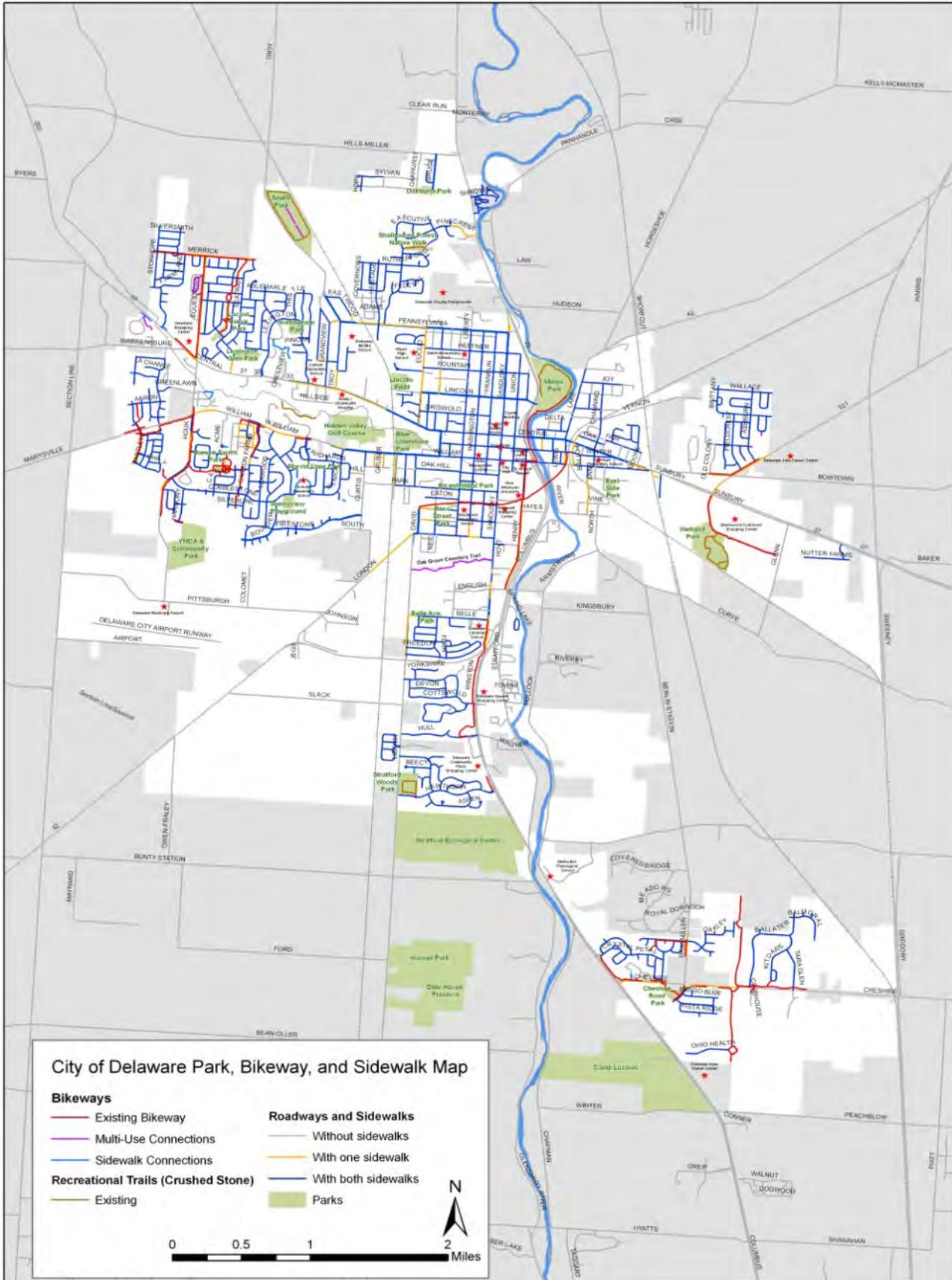


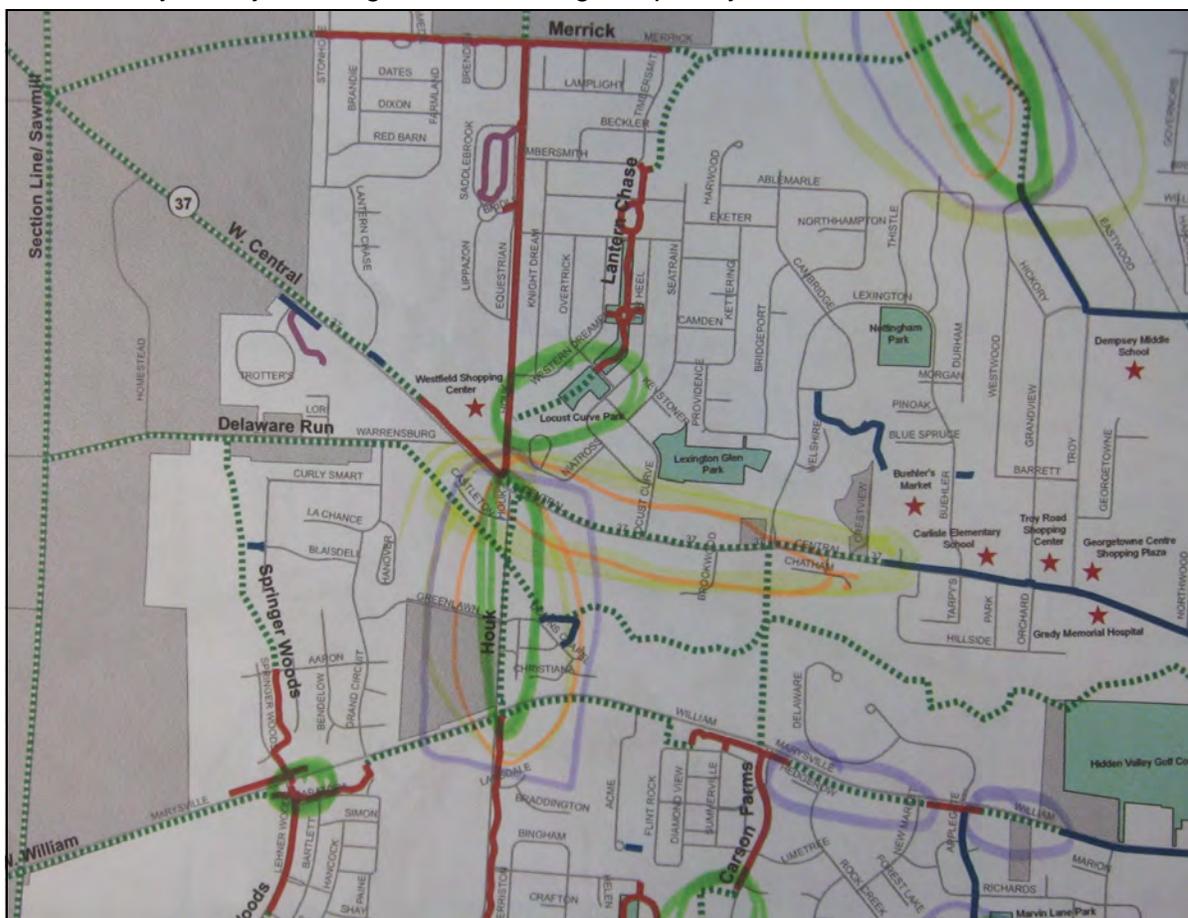
Figure 4-1: This map shows the location of existing (2010) bikeway and sidewalk infrastructure in the City of Delaware,

Proposed paths that were outside of the current municipal boundaries were not considered at this time because future annexation, development, and road construction should result in bikeways being constructed as a part of public-private development agreements or zoning code requirements. Additionally, a goal of this Plan is to create better coordination with county and regional proposed pathways for these segments.

### Prioritization Exercises

Beyond the internal exercise of developing proposed improvements, several stakeholder prioritization exercises were conducted. These included members of the Parks and Recreation Advisory Board, Planning Commission, and Staff from multiple departments.

During these exercises, participants identified priority areas. Though the exercises were tailed to each group, results had to be aggregated into a unified set of priorities. For example, Members of the Advisory Board discussed and decided their priority corridors by committee, resulting in their selections receiving 11 votes. The Planning Commission and the participating City officials voted by circling their priority areas with different colors of ink, allowing for votes to be counted for each area for which improvements were recommended while visually clearly showing the areas of highest priority.



A zoomed-in view of a section of the prioritization feedback map completed by City staff in September 2008.

Priority areas identified by participants had their votes assessed to the proposed improvements that could satisfy the area identified. The results of the exercise were entered into the GIS database. Proposed improvements were able to receive up to 21 of these scaled ‘votes’. Priority votes were converted to percentages for ease of comparison. A score of 100 percent is equivalent to an improvement receiving possible votes.

### Priority Projects

Prioritization exercises identified roughly half a dozen priority corridors for the City to focus on in the near-term. Two projects had a very high degree of agreement receiving 95 percent of the possible votes. These projects include building a bikeway along Houk Road between U.S. 36 and State Route 37, and another bikeway to be built along Olentangy Avenue between S. Sandusky and Henry streets. Three other projects scored in the 70 percent range including projects to expand bikeways along U.S. Highway 23, Bowtown Road, and the future extension of Boulder Drive. Projects extending the Springfield Branch trail westward and another connecting Troy Road Smith Park to the city had ratings of 67 and 38 percent respectively. Staff would expect, however, that as nodes of activity emerge in the future and as segments are completed new high agreement priorities will emerge. Thus, this plan calls for ongoing and regular update of information and stakeholder input.

<b>Priority Bikeway Projects</b>			
<b>Identifier</b>	<b>Bikeway name or priority areas</b>	<b>Priority Agreement Per-</b>	<b>Est. Cost</b>
Unique ID number	(some may include multiple projects or phases)	centage	(Paved Pathway costs only)
113.010, 113.020	Houk Road: U.S. Highway 36 to State Route 37	95%	\$90,567
117	Olentangy Avenue: Henry to Sandusky streets	95%	\$22,794
124.012, 124.020	US 23 South: Wal-Mart/Kroger	71%	\$0 to \$79,518
101.000, 102.000	Boulder Drive: Firestone Drive to Houk Road	71%	\$131,457
103	Bowtown Road Connector:SR 521 to the Point	71%	\$103,443
120.1	Springfield Branch: W. End to Firestone Drive	67%	\$172,347
122	Troy Road Smith Park Connector	38%	\$106,053
118	S Sandusky St (Existing Sidewalk Upgrade to Bikeway)	19%	\$37,075
112	Houk Rd.: Recreation Center to Boulder Drive	14%	\$51,243
129	Olentangy Ave (Connection to Stratford Rd.)	14%	\$56,680

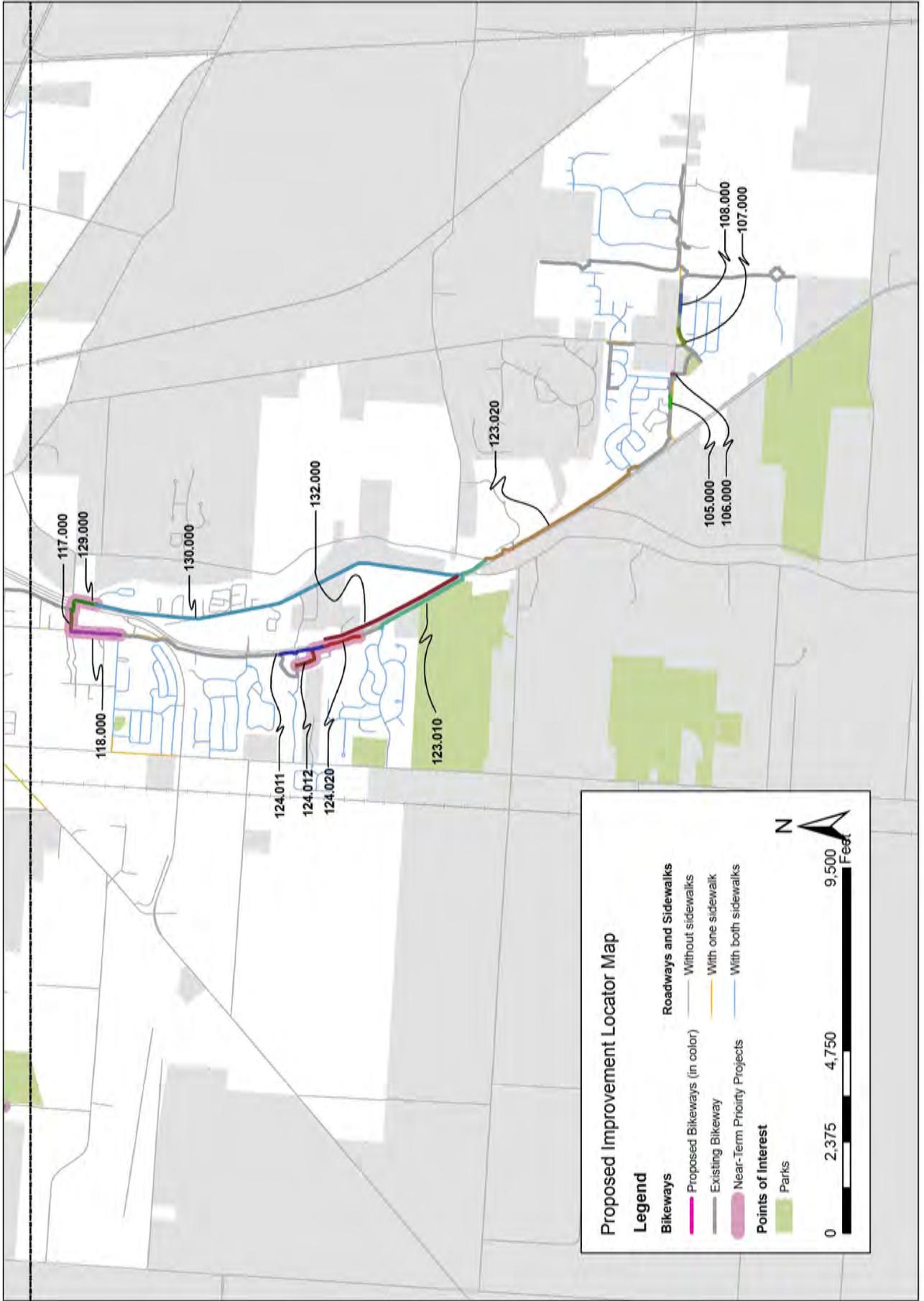
The table above shows the top ten priority areas for new bikeways - Total Estimated Project Costs are \$771,659 to \$851,177.

### Proposed Bikeway Improvement Projects

The Appendix to this Plan contains a complete listing of proposed improvements, including alternatives and phases for paths. Alternative routes are provided when more than one path route could be desirable for the continuation of a route. Though a set of alternative routes may be proposed, it is assumed that only one alternative would be constructed. A detailed explanation of each project can be found in the Appendix.



# Existing and Proposed Improvement Locator Map



<b>Priority Bikeway and Sidewalk Improvements: ranked by priority</b>		
<b>Identifier</b>	<b>Bikeway name or priority area</b>	<b>Priority</b>
Unique ID number	(some may include multiple projects or phases)	Agreement Percentage
113.010	Houk Road: US 36 to SR 37 (Phase 1)	95%
113.020	Houk Road: US 36 to SR 37 (Phase 2)	95%
117.000	Olentangy Avenue (Washington Sq. - Henry to Sandusky)	95%
124.011	US 23 South: Walmart/Kroger (Phase 1, Alt1)	71%
101.000	Boulder Dr. (Harmony Drive to Firestone Drive)	71%
102.000	Boulder Dr. (Houk to Harmony Drive)	71%
103.000	Bowtown Road Connector:SR 521 to the Point	71%
124.012	US 23 South: Walmart/Kroger (Phase 1, Alt2)	71%
124.020	US 23 South: Walmart/Kroger (Phase 2)	71%
120.100	Springfield Branch: W. End to Firestone Drive (Alt 1)	67%
122.000	Troy Road Park Connector	38%
118.000	S Sandusky (Ex. Sidewalk Upgraded to Bikeway)	19%
112.000	Houk Road: Recreation Center to Boulder Drive	14%
129.000	Olentangy Avenue (Optional Connection: to Stratford Rd.)	14%
116.010	Mingo North: Phase 1 (Pennsylvania Ave. to Mingo)	10%
120.200	Springfield Branch: W. End to Firestone Drive (Alt 2)	10%
125.000	US 36 / SR 37 (Glennwood Commons connector)	10%
127.010	W William St. Bikeway (Phase 1)	10%
127.020	W William St. Bikeway (Phase 2)	10%
104.000	Carson Farms Connector	5%
106.000	Cheshire Road Bikeway Gap (#2)	5%
107.000	Cheshire Road Bikeway Gap (#3)	5%
108.000	Cheshire Road Bikeway Gap (#4)	5%
109.000	Delaware Run: Complete Project	5%
110.000	E. William St. Bikeway (Mingo to Springfield Branch)	5%
114.000	Locust Curve Connector	5%
115.000	Merrick Road Connector	5%
116.020	Mingo North: Phase 2 (Pennsylvania Avenue to Pinecrest Drive)	5%
119.000	Springfield Branch Bikeway: East gap (End to E. Central)	5%
121.000	Troy Road North: (North of Troy Road Park)	5%
126.000	US 36 at Lehner Woods Blvd Gap	5%
128.000	Carson Farms / Lexington Drive Connector	5%
105.000	Cheshire Road Bikeway Gap (#1)	0%
111.010	Fairgrounds (Phase 1, 2009)	0%
111.020	Fairgrounds (Phase 2, 2010)	0%
123.010	US 23 South: Cheshire Conn. (Phase 1, Hawthorn to Stratford)	0%
123.020	US 23 South: Cheshire Conn. (Phase 2, Stratford to Cheshire)	0%
<b>Identifier</b>	<b>Sidewalk Connector name or priority area</b>	<b>Priority</b>
Unique ID number	(some may include multiple projects or phases)	Agreement Percentage
11.000	Firestone Drive (Lobdell to Delaware drives)	71%
3.000	Liberty Road SW Exp. (Stratford to Silver Maple)	19%
7.000	W. Central Sidewalk Expansion (Buehler's to Houk)	19%
8.000	W. William Sidewalk Expansion (section 1)	14%
9.000	W. William Sidewalk Expansion (section 2)	14%
4.000	Schultz Elem. Sidewalk Expansion (section: south)	10%
5.000	Schultz Elem. Sidewalk Expansion (south: north)	10%
10.000	W. William Sidewalk Expansion (section 3)	10%
1.000	E. Williams Sidewalk Expansion (Channing St. to the Point)	0%
2.000	Liberty Road Sidewalk Gap (S.O. of Belle Ave)	0%
6.000	SR 521 Sidewalk Gap (Kensington Pl. to N. P/L of Gas Station)	0%



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## Appendix A: Comparable Community Management Practices

Maintenance and management practices in Delaware were compared to those of similar bikeway managers in other communities and several county park districts in Ohio. Below, the maintenance and management practices for the City of Delaware are provided followed by the practices of comparable communities.

### Current maintenance and management procedure

The City of Delaware, Ohio is responsible for inspecting and maintaining a growing bikeway network with about 14 miles of paths constructed. While most of the City's paths were contributed by developers, some paths have been constructed by the City. In 2006, the Public Works department recognized a need to perform preventative maintenance to preserve the path system. In this year, a condition survey was completed and the department devised a plan to maintain the city's paths. The department used an annual budget of \$5,000 a year to contract private firms to apply several types of sealer in the hope of finding an optimum product. The budgeted amount for maintenance stayed constant between 2006 and 2008 despite a doubling of costs and a doubling of path mileage. All paths have yet to be sealed though the City desires to have all paths sealed on at least a five year rotation and in consideration of the results of regular inspections and condition ratings.

### Practices of Comparable Management Agencies

Several Ohio cities and county park districts were contacted to gather information on their bikeway management practices.

#### The City of Westerville, Ohio

The City of Westerville has implemented a lifetime maintenance program consisting of caulking cracks and seal coating its bikeways. The coating is applied as a part of a larger project to seal roadways across the city every five years and is contracted out to a private firm. The paths are primarily maintained out of the city's general fund but some paths are funded through a parks and recreation income tax levy. Westerville bikeways have bikeway signage and the paths are striped with a center line and stop bars.

#### The City of Dublin, Ohio

The City of Dublin does not apply sealer to its bike paths contending that it is merely "cosmetic." Minor repairs are conducted by the city's park maintenance crews and more difficult or complex repairs are handled by the street maintenance program as administered by their engineering department. Funding depends on the size of the project with smaller projects being funded by the parks department and larger projects being funded through the engineering department. The city dedicates a small annual budget toward the purpose of connecting developer contributed Bikepath segments. These gaps are outlined in a bike path master plan which is reviewed by key officials in January so projects can be incorporated into the next bid for street work. New paths are funded out of park and engineering CIP accounts. The city Website has a page detailing the city's bikeways and provides a contact for

those wishing to ask questions, provide feedback, or plan maintenance concerns.

### **The City of Troy, Ohio**

The City of Troy utilized ODOT grants to install the city's first bike paths in the 1970s. Cracks on these paths are patched as necessary but are not slurry sealed. Instead, these paths were paved every 12 to 15 years in conjunction with a city program to bid repaving projects for city streets, and public and private parking lots to help the municipality and local businesses take advantage of the lower costs of a high-volume paving contract. Upon the horizon of a need to replace pavement as determined by a five-year capital improvement plan, the park department starts a "paving savings fund" to finance the repair of city bike paths and park department parking lots.

### **The Greene County Park District**

The Greene County Park District of Greene County, Ohio manages more than 30 miles of bike paths that span the county. The county seal coats its trails every 5 years. The paths were expected to only last 20 years before they'd need to be repaved but the county believes its preventative maintenance may extend the pavements' lifespan even further. Originally, the county utilized a product called GSB 88, a black asphalt emulsion with "gilsonite." The maintenance director believes the product works very well and when applied with a silica sand application, it did a decent job of filling small cracks and providing an abrasive surface to increase traction. Recently, the county switched to using a product called RePlay that is an agricultural oil product that penetrates better and does not require additives to assist with traction. Unlike GSB 88, which is black and covers everything, RePlay does not require pavement markings to be masked off or otherwise protected in the chemical's application and for the time being is the cheaper alternative. Their aggressive program has prevented "alligator cracking [and] raveling" as well as other pavement deterioration signs and has been estimated to have saved the county over \$1.8 million in repaving costs based on ODOT's life span expectations. Freisthler Paving of Sidney, Ohio has worked with the county for 10 years and is a licensed distributor for both products.

## Appendix B: Legal Concerns and Relevant Codified Ordinances

In the course of conducting research and in preparing this Plan, several legal questions came to the forefront. The conclusions are provided below and are organized by topic. City departments should advise themselves of these concerns and contact the City Attorney if they have further questions.

### Sidewalks

Sidewalks are paths provided for pedestrians, including those using wheelchairs (ORC 4511.491). Bicycles are considered vehicles by the Ohio Revised Code (ORC 4511.01) and as such are permitted to ride on roadways. Bicycles are the only vehicle permitted to use sidewalks in Ohio, however their operation on sidewalks is subject to the restrictions of local municipal code (ORC 4511.711).

### Classifying Sidewalks as Bikeways

The concept of classifying sidewalks as bikeways was proposed for consideration. The following liability concerns rise out of such a proposal.

The American Association of State Highway and Transportation Officials (AASHTO) has established a standard for ten foot wide bike paths. This is the standard, accepted by the Ohio Department of Transportation (ODOT) is common and deemed acceptable for allowing two-way bike traffic on the same path. According to the AASHTO standard, when the width of a corridor is constricted, 8 feet is the minimum acceptable for a bikeway. In the City of Delaware, most sidewalks are between 4 and 6 feet in width and some are as narrow as 3 1/2 feet.

The reduced width may make it difficult for bikes traveling in opposing directions to pass each other. Yet, as a practical matter, this occurs with great regularity and without incident throughout subdivisions in Delaware and even around the nation. The reduced width may also make encounters with non-bicyclists more difficult especially if the other user is using a wheelchair. Though it may be burdensome, it is the responsibility of cyclists to yield to pedestrians, including those who are using wheelchairs, while they are on a sidewalk (ORC 4511.441).

Cyclists utilizing a sidewalk as if it is a bike path could contribute to creating an unsafe condition where cyclist–pedestrian and cyclists–cyclist accidents may be more likely to occur. This may increase the perception of liability in the event of an accident even though the burden lies on the cyclists to yield to pedestrians and to other cyclists. A city ordinance and signage requiring cyclists to yield to pedestrians and other cyclists may serve to reduce this liability concern. Nevertheless, in many instances using sidewalks for multi-modal purposes is the only practical alternative, is already being done by users in the ‘real world’, and is far safer overall than lane stripping which places bicyclists in direct conflict with cars—a conflict always ‘won’ by automobiles.

## Sidewalk Maintenance Responsibility

City code maintains that property owners are responsible for the upkeep of sidewalks on their property (§909.02.a). The designation of a concrete sidewalk as a route for pedestrians and cyclists, including route identification and directional signs, does not change the function the sidewalk and therefore does not change the maintenance responsibility of the sidewalk owner. If such a pedestrian path was constructed out of asphalt, the burden of maintenance would fall onto the City (§909.02.f). The City should consider amending this as many segments are constructed instead of constructing a sidewalk. If amended, the City should ensure the right to maintain these critical segments if a property owner fails to do so.

Should the city desire to utilize sidewalks to help connect sections of Bike Path, a preferable solution that would be the most agreeable to sidewalk owners and users may be to designate specific corridors with complete sidewalks (sidewalks that have no gaps and are ADA compliant) as a route and allowing cyclists to determine if they'd prefer to ride on the sidewalks or on the street. If cyclists are expected or encouraged to use the streets, Federal Highway Administration (FHWA) standards for accommodating cyclists on the street should be followed to facilitate safer cyclist travel on the roadway. More information regarding these standards is provided in the section titled Alternative Route Standards.

## Bikeways

Bikeways are used by a range of users including cyclists, pedestrians and those using rollerblades, skateboards and wheelchairs. Those using cycles with very narrow tires, as well as skateboards and rollerblades require a well-maintained surface to ride on. Because bikeway users utilize equipment that is more susceptible to surface imperfections paths need to be well maintained and free of hazards. Common hazards include projections (bumps caused by buckling pavement or roots pushing pavement upward) and cracks which can catch tires and wheels potentially contributing to accident and personal injury. As well as frequent flooding or standing water problems. These standards are more stringent than those for roadway surfaces and require a stricter standard of maintenance.

The following steps will limit the perception of liability for the city, though the legal standard may remain unchanged.

- Upon the report of such an unsafe condition, the city should act to mitigate the condition within a reasonable period of time or close the section (temporary). Warning signs should be posted until the repair can be completed.
- Establish maximum acceptable standards for pavement variations such as cracks and projections and procedures for their repair. These standards and procedures should guide maintenance of City paths.
- Preventative measures should be taken to reduce the instances of potentially hazardous situations, particularly through preventative maintenance and inspections.

## Alternative Route Standards

### Share-The-Road, Wide Curb Lane, and Striped Bike Lanes

Though this plan primarily focuses on the construction of roadway separated bikeways, the utilization of City streets for bike routes is not precluded and may be advantageous for helping to connect fragmented routes. Should the City choose to encourage cyclists to ride in the street, it is recommended that nationally recognized Federal Highway Administration (FHWA) standards for on-street bike route roadway treatments be followed, if local standards have not already been adopted.

These standards recommend specific treatments (signage, striping) for roadways with specific ranges of speed limits and average daily traffic (ADT) counts. Should a treatment be installed on a road, the city should monitor the roadway more often to verify that the ADT is not exceeding the maximum allowed under the standard. Solutions may include utilizing the next higher FHWA standard, taking steps to reduce traffic volume on that street, or implement traffic calming measures along a street segment.

In several places throughout the City, bikeways terminate into an on-street condition. Though alternative standards may be sufficient for cyclists to continue on their way, other path users may be left without an option to continue their trip. This should not be an issue when sidewalks are present; however, this is not always the case as some residential streets and access roads do not have sidewalks. In these situations such as on Winter Road or the U.S. Highway 23 access road near Cheshire Road, a striped shoulder and/or signage may be advisable to warn motorists of cyclists and pedestrians using the shoulder. This section has been successfully implemented for several years without incident.

## City Ordinances That Affect Bikeways and Cyclists

### §1111.08 (c) Minimum Pavement Widths and Other Public Improvements

(C) (5) In addition to sidewalks, bike paths shall be required in all open spaces in all subdivisions (unless the Planning Commission and Council grant a variance), in locations selected by the Planning Commission. In addition, bike paths shall be provided as shown in the Comprehensive Plan or to provide local and collector connections to those bike paths shown in the Comprehensive Plan.

Bike paths that follow, parallel, or intersect with any arterial road or arterial bike path shall be a minimum of 10' wide bike paths not located in the public right-of-way shall be within a public access easement. (Ord. 04-91. Passed 6-14-04.)

### §1111.04 (a) Final Plat

The final plat or supporting documentation shall contain:

(18) Notes detailing when parks, park development, bike paths, sidewalks in reserves, traffic controls, and similar items will be installed or developed. (Ord 04-91 Passed June 14, 2004)

### §1129.18 Acceptance of Public Improvements.

Acceptance of public improvements (including but not limited to streets, sidewalks, street lights, bike paths, street trees, etc.) shall be required of all public streets, whether a part of a subdivision or not.

Acceptance of public improvements for public sidewalks, street lights, and/or bike paths shall be required, whether a part of a public street or not or whether a part of a subdivision or not. (Ord. 04-91 Passed 6-14-04)

**§909.02 Responsibility, (f) Asphalt Walkways and Bikeways.**

Property owners, whose individual properties abut an asphalt pedestrian path or bikeway that has been constructed as part of the designated City bikeway and pedestrian pathway network, are not responsible for repair and replacement of the asphalt bikeways.

(Ord. 08-54.Passed 8-11-08.)

**Traffic Codes Governing Operation and Ownership of a Bicycle**

Chapter 373 of the City code governs traffic code as it pertains to bicycles and cyclists. This chapter may need to be revised as some codes may be outdated. Section 373.13 requires cyclists to have a bicycle license from the City Police Department (Ord. 2458, 2-14-55), that expires four years after they are issued and costs \$2.00 according to §373.14 (Ord. 90-15, 2-12-90). Section 373.15 requires cyclists to register and license their cycles with the Police Department and §373.19 requires bike owners to report changes in physical appearance (i.e. paint color) to the department within three days so records can be updated.

Beyond these codes, §373.12 (c) establishes that no one can ride a “bicycle, skateboard, roller skates or roller blades upon a sidewalk within the downtown area.” Council may choose to revisit this ordinance (91-107), passed in 1991, as it may be unnecessary and discourage biking to downtown. Biking to businesses downtown is an activity that reduces the need for downtown parking and may help boost retail activity. When necessary, those operating their bike in an unsafe fashion when there are too many pedestrians present may be able to be ticketed under §373.08 which governs instances of reckless operation of a bicycle.

A bikeway constructed within an open space landscape buffer along Houk Road as required by §1111.08 (c).



# Appendix C: Condition Standards

## Condition Survey

The 2008 Trail Inventory was conducted to not only locate and record path locations but also their relative condition. This survey utilized a simple system to rate bikeway conditions, resulting in path conditions being rated as either “good”, “fair”, or “poor”.

- Good: Paths with few if any defects, the most common being new cracks running parallel to both sides of the path.
- Fair: Path conditions have considerably more defects however these do not affect the path’s minimum safety.
- Poor: These paths may have asphalt failure with many cracks, some of which could be hazardous to cyclists and should be repaired.

The trail inventory revealed that roughly 87% of the cities bikeways were rated in “good” condition. Though this finding is encouraging, about 12% of the city’s 15 miles of pathways are currently rated as “Fair” and are at risk of further deterioration. As of the summer of 2008, only one section of bikeway path was rated as poor. Full results of pathway conditions are included as a part of the existing pathway trail summary in this plan.

## Condition Standards

Though the trail inventory gives the City a good idea of the condition of its bikeways, these standards are only approximate. More specific standards may be required to identify trail hazards such as cracks or projections that could contribute to cyclists losing control. Research on the topic of maintenance standards for bikeways failed to find a standard accepted by the Ohio Department of Transportation. A standard adopted by the Minnesota Department of Transportation is provided as an example of a standard the City of Delaware could utilize to define maintenance standards aimed at improving safety though these seem to have extremely tight tolerances that may not be financially feasible.

A possible standard for City bikeways was developed with the assistance of the City Public Way Inspector in the Engineering Department. The following table is a sample of a rubric that could be used to help create specific procedures to assess path conditions and mitigate potential hazards for cyclists and other users. It should be noted however, that these may be extremely tight tolerances that may not be financially feasible and thus defeat the purpose of having standards at all.

### Maximum Allowable Standards for Bikeway Surface Irregularities, Minnesota DOT.

Orientation of the Irregularity to Bike Traffic	Width of Cracks *	Height of Projections **
Parallel	13 mm (0.5 in)	10 mm (0.375 in)
Perpendicular	20 mm (0.75 in)	20 mm (0.75 in)

The standards provide a guide to maintenance workers to ensure safe facilities for cyclists. Standards address both cracks and projections that are either parallel or perpendicular to the direction of travel. A similar standard may be helpful toward guiding the City make bikeways safer. For more information: [http://www.dot.state.mn.us/bike/pdfs/Chapter%209%20Maintenance%20\(Web\).pdf](http://www.dot.state.mn.us/bike/pdfs/Chapter%209%20Maintenance%20(Web).pdf)

Sample Condition Rating System for the City of Delaware

	Good	Fair	Poor
<b>Cracks:</b> (parallel to trail edge)	¼" Max Width	½" Max Width	> ½" Width (Potentially hazardous)
<b>Cracks:</b> (perpendicular to trail edge)	¼" Max Width	¾" Max Width	> ¾" Width (Potentially hazardous)
<b>Projections:</b> (parallel to trail edge)	¼" Max Height	3/8" Max Height	> 3/8" Height (Potentially hazardous)
<b>Projections:</b> (perpendicular to trail edge)	¼" Max Height	¾" Max Height	> ¾" Height (Potentially hazardous)
<b>Waviness, Settling</b>	Smooth without any signs of settling or waves.	Some settling or waves but these do not inhibit recreation.	Significant – may cause tires to track in a direction, causing a bumpy ride or potentially hazardous condition.
<b>Weeds</b> (sprouting through pavement cracks)	Few if any, maximum of one growing through cracks per 20' length of path on average.	Two to four weed plants per 20' length of path on average.	In excess of four weeds per 20' length of path on average.
<b>Surface Condition</b>	Few if any imperfections, smooth or flat surface	Some surface imperfections, but bumps do not contribute to a rough ride.	Pot holes, surface pockmarks, rough surface that may jolt riders, swallow tires, contribute to accidents or injury.
<b>Safewalks / ADA Compliance</b> (wear and tear issues)	Few if any imperfections, smooth or flat surface	May have some accessibility problems. These should be noted and scheduled for repair.	Paths deemed inaccessible should be marked with signs. Necessary repairs should be identified and scheduled for repair.
<b>Action</b>	Continue annual inspection schedule. Consistently utilize preventative maintenance to protect path from deterioration.	Monitor path, identify potential hazards and mitigate. Conduct additional inspections if deemed necessary. Conduct preventative maintenance to reduce further deterioration and address problems that may become hazards	Take corrective action to: 1. sign potential hazards, 2. fix immediate hazards, or 3. close the path. Consider increasing the priority of the path to receive needed repairs/maintenance.

**Sample Condition Rating System for the City of Delaware Ohio.** To use, perform inspection and circle average condition per category. Path condition is generally the column with the most circles; with the following exceptions:

- A rating of “good” may not contain “poor” rating in more than one category.
- Paths generally rated with an average between categories should be considered as falling within the lower of the two categories.
- Other factors may be noted and taken into account in determining the Bikeway condition rating.

## Appendix D: Existing Bikeways

Existing bikeways were identified and inventoried during the summer of 2008. In addition to geocoding path locations using a Geographic Positioning System (GPS) device, physical attributes were recorded such as path width, length, surface material and pavement condition. These attributes were entered into the City's Geographic Information System (GIS) database to facilitate record keeping and to allow data mapping. A summary of this information has been prepared into a table for quick reference.

Existing Bikeways						
Trail name	Length	Condition	Type	Surface	Width	ID
<b>Bowtown</b>	<b>827 ft</b>	Good	Multi-use	Asphalt	8 ft	75
Braumiller	253 ft	Good	Multi-use	Asphalt	8 ft	56
Braumiller	27 ft	Good	Multi-use	Wood bridge	8 ft	57
Braumiller	377 ft	Good	Multi-use	Asphalt	8 ft	58
<b>Braumiller (Total)</b>	<b>657 ft</b>					
Carson Farms	143 ft	Good	Multi-use	Asphalt	8 ft	35
Carson Farms	372 ft	Good	Multi-use	Wood bridge	8 ft	36
Carson Farms	1,362 ft	Good	Multi-use	Asphalt	9 ft	38
Carson Farms	305 ft	Good	Multi-use	Asphalt	9 ft	37
Carson Farms	512 ft	Fair	Multi-use	Asphalt	9 ft	34
<b>Carson Farms (Total)</b>	<b>2,694 ft</b>					
Carson Farms Park	146 ft	Good	Multi-use	Asphalt	8.5 ft	24
Carson Farms Park	555 ft	Good	Multi-use	Asphalt	8.5 ft	25
Carson Farms Park	253 ft	Good	Multi-use	Asphalt	7 ft	26
Carson Farms Park	146 ft	Good	Multi-use	Asphalt	8 ft	28
Carson Farms Park	556 ft	Good	Multi-use	Asphalt	8.5 ft	29
Carson Farms Park	56 ft	Good	Multi-use	Asphalt	6 ft	30
Carson Farms Park	49 ft	Good	Multi-use	Asphalt	6 ft	31
Carson Farms Park	40 ft	Good	Multi-use	Asphalt	8.5 ft	32
Carson Farms Park	303 ft	Good	Multi-use	Asphalt	6 ft	33
Carson Farms Park	1,959 ft	Good	Multi-use	Asphalt	8 ft	23
Carson Farms Park	55 ft	Good	Multi-use	Asphalt	8 ft	22
Carson Farms Park	866 ft	Fair	Multi-use	Asphalt	8 ft	27
<b>Carson Farms Park</b>	<b>4,984 ft</b>					

Existing Bikeways (cont.)						
Trail_name	Length	Condition	Type	Surface	Width	ID
Cheshire	412 ft	Good	Multi-use	Asphalt	8 ft	67
Cheshire	757 ft	Good	Multi-use	Asphalt	9 ft	66
Cheshire	945 ft	Good	Multi-use	Asphalt	8 ft	68
Cheshire	2,675 ft	Good	Multi-use	Asphalt	10 ft	69
Cheshire	277 ft	Good	Multi-use	Asphalt	9 ft	70
Cheshire	409 ft	Good	Multi-use	Asphalt	10 ft	71
<b>Cheshire</b>	<b>5,476 ft</b>					
<b>Cheshire Crossing</b>	<b>1,448 ft</b>	Good	Multi-use	Concrete	8 ft	55
Glenn	7,114 ft	Good	Multi-use	Asphalt	8 ft	72
Glenn	619 ft	Good	Multi-use	Asphalt	8 ft	73
<b>Glenn (Total)</b>	<b>7,733 ft</b>					
Henry	5,673 ft	Good	Multi-use	Asphalt	10 ft	49
Henry	1,579 ft	Good	Multi-use	Asphalt	10 ft	50
<b>Henry (Total)</b>	<b>7,252 ft</b>					
Houk	4,090 ft	Good	Multi-use	Asphalt	8 ft	2
Houk	4,528 ft	Good	Multi-use	Asphalt	8 ft	3
Houk	169 ft	Good	Multi-use	Asphalt	9 ft	74
<b>Houk (Total)</b>	<b>8,787 ft</b>					
<b>Kensington</b>	<b>1,258 ft</b>	Good	Multi-use	Asphalt	8 ft	54
Lantern Chase	72 ft	Good	Multi-use	Asphalt	10 ft	4
Lantern Chase	172 ft	Good	Multi-use	Asphalt	10 ft	5
Lantern Chase	2,504 ft	Fair	Multi-use	Asphalt	8 ft	7
Lantern Chase	120 ft	Fair	Multi-use	Asphalt	9 ft	8
Lantern Chase	141 ft	Fair	Multi-use	Asphalt	9 ft	9
Lantern Chase	158 ft	Fair	Multi-use	Asphalt	9 ft	6
<b>Lantern Chase (Total)</b>	<b>3,169 ft</b>					
Lehner Woods	174 ft	Good	Multi-use	Asphalt	9 ft	11
Lehner Woods	1,079 ft	Good	Multi-use	Asphalt	8 ft	12
<b>Lehner Woods (Total)</b>	<b>1,254 ft</b>					
<b>Merrick</b>	<b>3,382 ft</b>	Good	Multi-use	Asphalt	8 ft	1

## Existing Bikeway

Trail_name	Length	Condition	Type	Surface	Width	ID
Mingo	1,357 ft	Good	Low-volume street	Asphalt	0 ft	46
Mingo	1,199 ft	Fair	Multi-use	Asphalt	8 ft	47
Mingo	1,085 ft	Fair	Multi-use	Asphalt	10 ft	48
<b>Mingo (Total)</b>	<b>3,641 ft</b>					
Old Cheshire	65 ft	Good	Multi-use	Asphalt	7.5 ft	62
Old Cheshire	121 ft	Good	Multi-use	Asphalt	9 ft	63
Old Cheshire	268 ft	Good	Driveway	Concrete	0 ft	64
Old Cheshire	616 ft	Good	Multi-use	Asphalt	9 ft	65
Old Cheshire	293 ft	Good	Multi-use	Asphalt	10.5 ft	106
Old Cheshire	53 ft	Good	Multi-use	Asphalt	9 ft	59
Old Cheshire	515 ft	Good	Multi-use	Asphalt	9 ft	60
Old Cheshire	602 ft	Fair	Multi-use	Asphalt	7.5 ft	61
<b>Old Cheshire (Total)</b>	<b>2,532 ft</b>					
<b>Springer Woods</b>	<b>1,275 ft</b>	Good	Multi-use	Asphalt	8 ft	13
Springfield Branch	306 ft	Good	Multi-use	Asphalt	8 ft	39
Springfield Branch	54 ft	Good	Multi-use	Asphalt	10 ft	40
Springfield Branch	5,017 ft	Good	Multi-use	Asphalt	10 ft	41
Springfield Branch	500 ft	Good	Multi-use	Asphalt	10 ft	42
Springfield Branch	770 ft	Good	Multi-use	Asphalt	10 ft	43
Springfield Branch	55 ft	Good	Multi-use	Asphalt	10 ft	44
Springfield Branch	449 ft	Good	Multi-use	Asphalt	10 ft	45
<b>Springfield Branch (Total)</b>	<b>7,152 ft</b>					
U.S. 23 South	1,915 ft	Good	Low-volume street	Asphalt	0 ft	51
U.S. 23 South	1,289 ft	Good	Low-volume street	Asphalt	0 ft	107
U.S. 23 South	2,018 ft	Fair	Multi-use	Asphalt	10 ft	52
U.S. 23 South	620 ft	Poor	Multi-use	Asphalt	7.5 ft	53
<b>U.S. 23 South (Total)</b>	<b>5,842 ft</b>					
W. Central	1,072 ft	Good	Multi-use	Asphalt	8 ft	10
W. William	1,074 ft	Good	Multi-use	Asphalt	8 ft	18
W. William	276 ft	Good	Multi-use	Asphalt	9 ft	15
W. William	92 ft	Good	Multi-use	Asphalt	8 ft	19
W. William	154 ft	Good	Multi-use	Asphalt	9 ft	20
W. William	816 ft	Good	Multi-use	Asphalt	8 ft	14
W. William	74 ft	Good	Multi-use	Asphalt	8 ft	16
W. William	872 ft	Good	Multi-use	Asphalt	9.5 ft	17
W. William	361 ft	Good	Multi-use	Asphalt	10 ft	21
<b>W. William (Total)</b>	<b>4792 ft</b>					



# Existing Infrastructure Segment Locator Inset Maps

North Houk



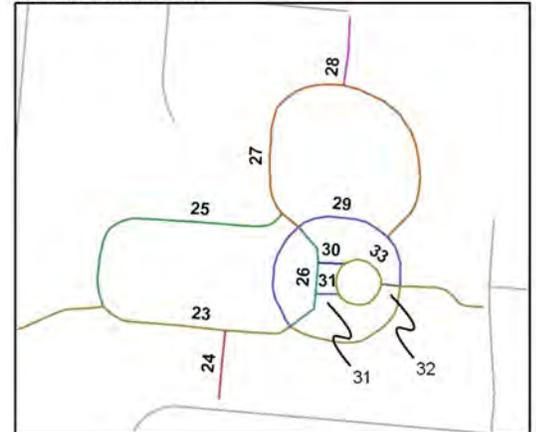
Lehner / Springer Woods



South Houk

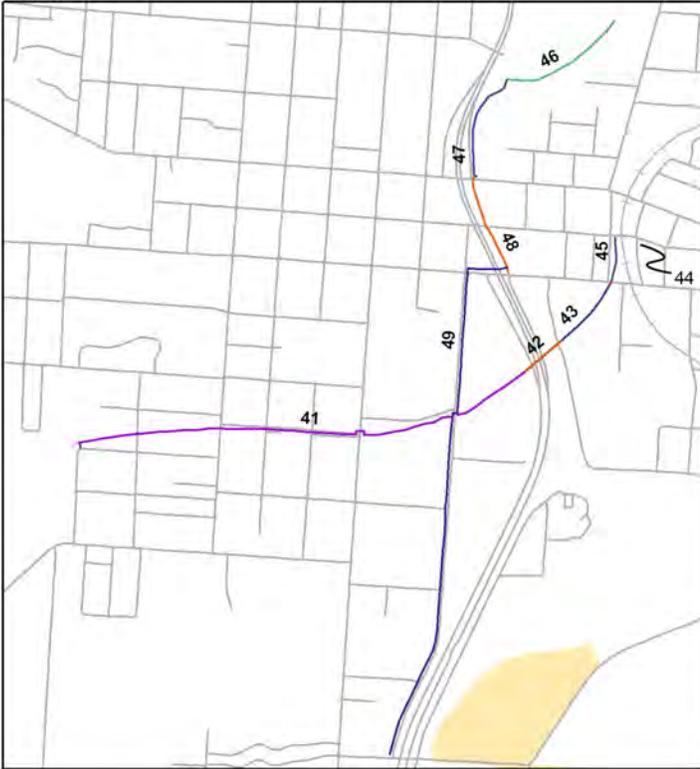


Carson Farms Park



# Existing Infrastructure Segment Locator Inset Maps

Central



US 23 South



Kensington



Cheshire



Mill Run Crossing





# Appendix E: Proposed Bikeway Improvements

Proposed improvements have been researched and developed and are presented here as refined proposals. The following section describes the methodology and assumptions used to create the descriptions of proposed improvement.

## Description Methodology

### Naming Methodology

Proposed improvements detailed within this section vary by two dimensions. First in name, which separates short and long improvements. The second classifying the kind of segment improvement proposed in the description of proposed improvements.

Each improvement found in the following section is a segment. For the purposes of this plan, a segment is a contiguous section of path that could either fill a gap between existing bikeways or result in an expansion of the Bikeway system. Most improvements are comprised of only one segment. Improvements are identified by unique identification numbers or UIDNs. These numbers include a three digit project number followed by three decimals that provide additional information.

### Gaps and Expansions

Segments, in name only, are separated into two categories, gaps and expansions. Gaps are less than 660 feet or 1/8 mile in length. Improvements longer than 660 ft. are called expansions.

### Special Cases: Alternatives and Phases

Though most improvements are straightforward and involve one segment, there are exceptions. Some improvements may allow for alternative routes that complete the same gap but provide choices in where the path can be sited. These alternatives have the same path name but are listed as alternatives. In other situations, some path expansions may be quite long. If it seemed logical, some of these improvement proposals were broken down into phases and each phase is listed as a separate segment.

There is at least one proposal that includes an alternative route for a particular phase of a project. For example, in the illustrated situation there are two phases of the project to connect the existing bikeway (grey) between points A and C. These phases for project 124 are denoted by .01X and .02X for phases one and two respectively. Alternatives one and two for phase one are denoted by .X11 and .X12 respectively. Both alternatives connect the existing bikeway with point B, one through the existing commercial development and one through a new separated path adjacent to US 23.



### Explanation of segment descriptions used to detail proposed improvements to close gaps and expand the bikeway network

The following is a list of the categories (underlined) used to describe each improvement. A short description follows each category explaining the methodology used to determine each value.

#### Name of Bikeway Segment:

- Gaps: segments shorter than 1/8 mile or 660 feet.
- Expansions: segments longer than 1/8 mile or 660 feet.

UIDN: Unique ID Number. A number that identifies specific improvements, alternative paths, phases and alternative paths for phase segments. (Note: A more detailed explanation of what alternative paths, phases and alternative paths for phase segments is below).

Format for UIDNs is AAA.BCD (i.e. 101.213)

- AAA: Bikeway or Sidewalk Connector improvement identification number. Sidewalk Connector improvements are numbered zero to 99 and Bikeway improvements are numbered greater than 100.
- B: Alternative Path Number (AAA.1BC - AAA.9CB) for alternative paths for the same improvement.
- C: Phase number for the (AAA.B1D - AAA.B9D) for the phasing of improvement AAA. If there are alternative path numbers (B), it would be the phased improvement of that respective alternative path.
- D: Alternative Path of a specific phase (AAA.DC1-AAA.DC9) is the number that corresponds to an alternative path of a specific phased segment of a larger path. (In example, if you are trying to connect point A to point C and the project is phased with point A to B as the first segment and B to C as the second phase. If the first phase had two possible paths, this number would identify the specific segment alternative for the A to B phase of the overall path A to C).

Path Length: Total length of path (line segment in GIS).

Paved Length: This length is the length of path that would require base work and paving. This is calculated by subtracting the width of all roadways that the bikeway crosses.

ROW Length: Linear distance of property that may need to be procured (outright or bikeway easement) in order to install a Bikepath. If the path is located along the front of a property line, the length would be the length of the frontage in which the path was fully on private property. If the path traverses through a property, it would be the length of the path as it passes through the property. Actual square footage of ROW needed for a project depends on the actual path but this number gives an idea of the amount of ROW required. With some degree of accuracy, this number could be multiplied by the width of a bikeway corridor (10' width, two 2' shoulders) to provide an approximate number of square feet required to route a path along or through a property.

Project Benefits: A description of the benefits that may result from this project.

Notes: A description of most of the possible factors that may impact the cost of the project beyond the length of paved path. Items may include retaining walls, bridges, culvert work, earth work, and curb and guardrail work.

Cost Estimate: Based on the cost of a Bikeway construction contract awarded by Liberty Township, Delaware County, Ohio to complete a 4,400 feet of path. The 10' wide path was contracted out for \$153,970 with a unit price of \$4.35/SF or \$43.50/LF of path. Concrete segments were estimated at \$7/SF as recommended by the Engineering Department. Though actual prices will vary, these prices will give a ballpark idea of how much an improvement may cost in addition to the additional work contained in the "notes" section.

Project Partner: Prospective parties who may partner with the city in contributing the segment of path. These parties may include land developers, if the parcel appears to be "developable." Should the land not appear to be "developable," the city is listed as the project partner.

**SUMMARY TABLE OF PROPOSED IMPROVEMENTS**

<b>Proposed Improvements</b>		
		<b>Est. Cost</b>
<b>Path Type</b>	<b>Path Length</b>	(Paved pathway costs only)
Bikepath	60,450 ft. (11.45 miles)	\$2,260,757 to \$2,340,275
Recreational Trail	16,314 ft. (3.09 miles)	\$400,672
Supportive Sidewalks	17,967 ft. (3.40 miles)	\$584,090
<b>TOTAL</b>	<b>94,731 ft. (17.94 miles)</b>	<b>\$3,245,519 to \$3,325,037</b>

## Bikeways Improvement Projects

(in order of Unique ID Numbers)

### Boulder Drive Bikeway Expansion (Firestone Drive to Harmony Drive)

**UIDN:101.000**

**Path Length:** 2452'

**Paved Length:** 2452'

**ROW required:** 2452'



**Project Benefits:** A Bikeway project to be completed with the construction and build-out of Boulder Drive, creating connectivity for cyclists from the end of Firestone Drive to the future city recreation center.

**Notes:** To be constructed with Boulder Drive and surrounding housing development. Actual path and path length to be determined by developer.

**Phases required:** 1

**Cost estimate:** ~\$106,662.00, plus any other costs.

**Project Partner:** Medrock LLC, land developer

### Boulder Drive Bikeway Gap (Harmony Drive to Houk Road)

**UIDN:102.000**

**Path Length:** 570'

**Paved Length:** 570'

**ROW required:** 570'



**Project Benefits:** Will allow future neighborhoods east of the Harmony Drive access to the future city recreation center on Houk Road.

**Notes:** Connects Houk Road to end of the short segment of pathway along Boulder Drive as contributed by local developer. Project is 570' of pavement, and no earthwork is required. Project may be phased with the completion of Boulder Drive, connecting it to Houk Road.

**Phases required:** 1

**Cost estimate:** ~\$24,795.00, plus any other costs.

**Project Partner:** Land developer

### Bowtown Road Bikeway Expansion (The Point to SR 521)

**UIDN:103.000**

**Path Length:** 2480'

**Paved Length:** 2378'

**ROW required:** 2005'



**Project Benefits:** This project will connect east Delaware to the Kensington Place subdivision through the Point.

**Notes:** Bike Path Extension across private land, mostly outside of ROW. Developable parcels have frontages of 384', 118', 141' for which developer contributions could be generated.

**Phases required:** 1 of 2

**Cost estimate:** ~\$103,443.00, plus any other costs including Right-Of-Way purchase.

**Project Partner:** City of Delaware, land developers.



Denotes a Top-10 Priority Improvement

**Carson Farms Bikeway Gap**

**UIDN:104.000**

**Path Length:** 660'

**Paved Length:** 660'

**ROW required:** 660' (linear feet)

**Project Benefits:** Connects the Meadows at Carson Farms and a 2000 foot long length of bikeway to the Houk Road bikeway and the future recreation center.

**Notes:** Connects segments of the Carson Farms bikeway along a lake owned by the Meadows of Carson Farms, through a Dominion Homes development and connecting to a segment of bikepath in the Carson Farms subdivision. Should require little earthwork. Actual path may be adjusted through the platting of the Dominion Homes parcel.

**Phases required:** 1

**Cost estimate:** ~\$28,710.00, plus any other costs.

**Project Partner:** Land developers, including Dominion and the Meadows of Carson Farms.

**Cheshire Road Bikeway Gap (Section 1)**

**UIDN:105.000**

**Path Length:** 304'

**Paved Length:** 304'

**ROW required:** 304' (linear feet)

**Project Benefits:** Section one is the second longest of four improvements to fill the gaps in the Cheshire Road Path between Glenn Parkway and U.S. Highway 23. Once completed, the path will have a combined length of 1.75 miles.

**Notes:** Path traverses parcel that have yet to be fully developed.

**Phases required:** 1

**Cost estimate:** ~\$13,224.00, plus any other costs.

**Project Partner:** Land developer

**Cheshire Road Bikeway Gap (Section 2)**

**UIDN: 106.000**

**Path Length:** 90'

**Paved Length:** 37'

**ROW required:** 0' (linear feet)

**Project Benefits:** Section two is the least expensive and most simple of four improvements to fill the gaps in the Cheshire Road Path, yielding a combined length of 1.75 miles.

**Notes:** Very limited earthwork, culvert work. Path requires minimal pavement, a marked crosswalk and no ramps.

**Phases required:** 1

**Cost estimate:** ~\$1,609.50, plus any other costs.

**Project Partner:** City of Delaware.

### Cheshire Road Bikeway Gap (Section 3)

**UIDN:107.000**

**Path Length:** 500'

**Paved Length:**

406' (of 5' width expanded to 10' width)

32' linear feet of 10' wide ramps

Total square footage of project: 2350 SF

**ROW required:** 0'

**Project Benefits:** The third of four improvements to complete the Cheshire Road Path, this project calls for the widening of a 5' to 5' 6" sidewalk to a width of 10' and the installation of two curb cuts, a two ramps and a crosswalk at Braumiller Road and Cheshire Road. This crossing may eventually require additional investments such as a refuge island or perhaps a user activated flashing warning light. This improvement will increase safety and connectivity on the Cheshire Bikeway.

**Notes:** Connects sections of 10' to 8' bikeway and existing concrete sidewalk should be wider than 5' to 5'6" if a core bikeway network segment. Ramps to cross Cheshire and a pedestrian island and warning lights may be required at the intersection of Cheshire and Braumiller roads.

**Phases required:** 1

**Cost estimate:** ~\$16,450.00 (concrete, \$7.00/SF)

**Project Partner:** City of Delaware

### Cheshire Road Bikeway Gap (Section 4)

**UIDN:108.000**

**Path Length:** 475'

**Paved Length:** 475'

**ROW required:** 452' (linear feet)

**Project Benefits:** Section four is the longest of four improvements to fill the gaps in the Cheshire Road Path which, when completed, will be 1.75 miles long.

**Notes:** Connects the existing bikeway along Cheshire Road with the Glenn Road paths and points east. This appears to be a simple project.

**Phases required:** 1

**Cost estimate:** ~\$20,662.50, plus any other costs.

**Project Partner:** City of Delaware

### Delaware Run Path / Blue Limestone Path / Warrensburg Road Path

**UIDN:109.000 / 109.020 / 109.010**

**Path Length:** 16,314'

**Paved Length:** 10,800' of Crushed stone recreational pathway / 2,009' asphalt / 3,598' asphalt path

**ROW required:** 5,030'

**Project Benefits:** This stream corridor path will create an exciting recreational destination for residents and others to bike/walk along the Delaware Run.

**Notes:** The project will require multiple bridges over the run, several road crossings (with warning lights) as well as a crossing under or over the CSX tracks near Blue Limestone Park.

**Phases required:** Multiple

**Cost estimate:** ~\$709,659.00 for asphalt, however, crushed stone has been set as the path type for the Delaware Run area with recent projects has been costed at \$3.07 per LF or about \$400,672 total for an 8 ft. wide path. Project will require the purchase of land and higher maintenance requirements given part of the path is in a floodplain. The other two segments are proposed as asphalt pathways along Warrensburg Road and through Blue Limestone Park.

**Project Partner:** City of Delaware, Land developer.

**E Williams Street (Connect Mingo Trail to east end of Springfield Branch)****UIDN:110.000****Path Length:** 1430'**Paved Length:** 1000'**ROW required:** 605'**Project Benefits:** This connection will create path loop or circuit for runners and cyclists between the Mingo and Springfield Branch bikeways.**Notes:** The project requires some slightly larger ROW easements on E. Williams street to accommodate a wider path (as only sidewalk exists today). A reworking of ramps and crosswalk pitches will be required to accommodate cyclists. The north sidewalk on the E. Williams bridge over the Olentangy may not be sufficiently wide enough for two directions of bike traffic (8' minimum required). Accommodating a wider path would necessitate either fewer lanes or narrower lanes for automobile travel across the bridge. Some limited retaining wall work may also be required.**Phases required:** 1 of 1**Cost estimate:** ~\$43,500.00, plus any other costs.**Project Partner:** City of Delaware.**Fairgrounds Bikepath (Phase 1, 2009—Anticipated)****UIDN:111.010****Path Length:** 2883'**Paved Length:** 2883'**ROW required:** 0'**Project Benefits:** Development of biking facilities at the county fairgrounds.**Notes:** Phase 1 of Fairground Bikeway (To be completed in 2009).**Phases required:** 1 of 2**Cost estimate:** ~\$125,410.50, plus any other costs.**Project Partner:** Delaware County**Fairgrounds Bikeway Expansion (Phase 2, 2010—Anticipated)****UIDN:111.020****Path Length:** 3175'**Paved Length:** 3175'**ROW required:** 0'**Project Benefits:** Development of biking facilities at the county fairgrounds.**Notes:** An improvement specified in the County Fairgrounds master plan.**Phases required:** 2 of 2**Cost estimate:** ~\$77,430.00, plus any other costs.**Project Partner:** Delaware County.**Fairgrounds Bikeway Expansion (Future Phases)****UIDN:111.030 / 111.040****Path Length:** 2312' / 2232'**Paved Length:** 2312 / 2232'**ROW required:** 0'**Project Benefits:** Development of biking facilities at the county fairgrounds and link neighborhoods.**Notes:** An improvement specified in the County Fairgrounds master plan. 111.030 would connect from the mid point of the Grounds to Pinecrest Ave. and 111.040 would connect an alternate entrance pathway at Liberty St. north to the mid point of the Grounds.**Phases required:** 2**Cost Estimate:** Not estimated.**Project Partner:** Delaware County.

### Houk Road Bikeway Expansion (Recreation Center to Boulder Drive)

**UIDN:112.000**

**Path Length:** 1231'

**Paved Length:** 1178'

**ROW required:** 1176'



**Project Benefits:** Connects the future Recreation Center to the bikeway along Houk Road. This critical link is necessary to connect the center with the rest of the bikeway network.

**Notes:** This project should not require any earthwork or other special provision. Two ramps have already been constructed at Boulder however two ramps and a crosswalk must be constructed at the recreation center entrance.

**Phases required:** 1

**Cost estimate:** ~\$51,243.00, plus any other costs.

**Project Partner:** Land developers (Medrock LLC), City of Delaware.

### Houk Road Bikeway Expansion (US 36 to SR 37: Phase 1)

**UIDN:113.010**

**Path Length:** 1400'

**Paved Length:** 1227'

**ROW required:** 1300'



**Project Benefits:** This bikeway is the first phase of a project to provide pedestrian and bikeway connectivity between northwest and southwest Delaware, State Route 37 and US Highway 36. The separation is largely caused by the Delaware Run and a lack of roads or development that bridge over the minor tributary. This results in residents in the southwest being separated from the new commercial center at Houk and State Route 37 and northwest residents being separated from the future recreation center to be built on S. Houk. Complicating matters, being one of the only connections, Houk Road is well traveled and potentially more dangerous for pedestrians and cyclists to use. The first phase could be timed with the development of the corner parcel at Houk and State Route 37.

**Notes:** Path requires three ramps, ROW purchase or vacation, and a 30' bridge, new culvert, or elongation of current culvert to complete.

**Phases required:** 1 of 2

**Cost estimate:** ~\$53,374.50, plus the cost of the bridge, new culvert or extension of existing culvert. Project could be combined with any future Houk Road widening project or development at the corner of Houk and SR 37. Alternatively, a possible solution could be to route the pathway onto the existing auto bridge together with protected bike lanes (perhaps in the short term or perhaps permanently).

**Project Partner:** Land Developer and/or City of Delaware.

### Houk Road Bikeway Expansion (US 36 to SR 37: Phase 2)

**UIDN:**113.020

**Path Length:** 649'

**Paved Length:** 613'

**ROW required:** 0'

**Project Benefits:** This bikeway is the second phase of connecting a necessary link between the northwest and southwest corners of the city. Delaware Run separates the corners of city, separating the commercial activity of the northwest from employment centers and the future recreation center to the southwest. Houk Road connecting the two is a well traveled, narrow two lane road and is not well suited for cyclists making the commute. Once the northern half of the project has been completed, the north and south ends of the bikeway will be connected, yielding over 2 miles in length.

**Notes:** One crosswalk, two ramps at a 30' curb-cut entrance to Trillium Condos.

**Phases required:** 2 of 2

**Cost estimate:** ~\$37,192.50 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width). Project could be combined with any future Houk Road widening project.

**Project Partner:** City of Delaware.



### Locust Curve Highlands Bikeway Expansion

**UIDN:**114.000

**Path Length:** 931'

**Paved Length:** 890'

**ROW required:** 900' (linear feet)

**Project Benefits:** Connects the Meadows at Carson Farms and 2000' of Bikeway to the Houk Road bikeway and the future recreation center.

**Notes:** Connects the Locust Curve Bikeway with the Houk Road Bikeway near the Kroger Grocery store at Houk Road and SR 37. Segment runs between the rear property line of homes on Western Dreamer Rd and a detention basin and then a forested area. Path will require ramps at Houk Road and may require a warning light or pedestrian island for cyclists to cross the road. Some earthwork may be required.

**Phases required:** 1

**Cost estimate:** ~\$38,715.00 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width) in addition to some earthwork, a pedestrian island and a user activated warning light in lieu of a future signalized intersection.

**Project Partner:** City of Delaware, Locust Curve Association

### **Merrick Road Connector, Phase 1 (Merrick Blvd to Troy Road)**

**UIDN:115.000**

**Path Length:** 2167'

**Paved Length:** 2167'

**ROW required:** 2167'

**Project Benefits:** Connects Locust Curve subdivision as well as Merrick Blvd to Troy Road and the Smith Park.

**Notes:** Appears to be a simple project. Work with developers to contribute portions as Merrick Blvd is constructed.

**Phases required:** 1 of 1

**Cost estimate:** ~\$173,695.00, plus any additional costs.

**Project Partner:** Developer, City of Delaware.

### **Mingo Park Path, Extension (Mingo Path to Pennsylvania Avenue)**

**UIDN:116.000**

**Path Length:** 2365'

**Paved Length:** 2282'

**ROW required:** 0'

**Project Benefits:** The project will allow for a northward extension of the Mingo / U.S. 23 Bikeway path connecting Mingo Park to Pennsylvania Avenue.

**Notes:** Requires construction through a forested area which may be a wetland. Also, requires a bridge over U.S. Highway 23 which will require significant earthwork to meet ADA standards.

**Phases required:** 1

**Cost estimate:** ~\$99,267.00, plus a pedestrian bridge over U.S. Highway 23 and related earthwork as well as costs associated with constructing a path through a forest that may be a wetland. If so, the project may be more complicated and costly to construct.

**Project Partner:** City of Delaware.

**Olentangy Avenue Bikeway Gap (S. Sandusky Avenue to Henry Street)**

**UIDN:117.000**

**Path Length:** 574'

**Paved Length:** 524'

**ROW required:** 0' (linear feet)



**Project Benefits:** This project will connect to the 2 mile Henry/Mingo Trail. With the completion of the S. Sandusky Bikeway Expansion (118.000) that connects to the S. Sandusky/U.S. Highway 23 Trail, the total length of the Mingo through U.S. Highway 23 trail would be over 3.35 miles in length.

**Notes:** Connects Henry Street path to S. Sandusky Street. Significant earthwork and modification to a guardrail will be required to allow the path to be placed along the roadway.

**Phases required:** 1

**Cost estimate:** ~\$22,794.00, plus some culvert and earthwork, right of way purchase.

**Project Partner:** City of Delaware, with contribution from Washington Square Shopping Center.

**S. Sandusky Bikeway Expansion  
(Belle Avenue to Olentangy Avenue)**

**UIDN:118.000**

**Path Length:** 1297'

**Paved Length:** 1177'

**ROW required:** 50' (linear feet)



**Project Benefits:** A necessary project for allowing cyclists to travel between Olentangy Avenue and Belle Avenue on an improved surface. The current sidewalk, only 3'6" wide, is insufficient for cyclist traffic and should be widened to a width of at least 8'. Once this improvement and the Olentangy Avenue Bikeway gap are completed, the path will become the city's longest providing over 3.35 miles of improved trail for cyclists and other path users.

**Notes:** A simple project. Existing sidewalk to be widened and replaced with a bikeway

**Cost estimate:** ~\$37,075.50 (\$7.00/SF, 4'6" wide concrete path, 8' width) in addition to sections of existing sidewalks that need to be replaced.

**Project Partner:** City of Delaware

**Springfield Branch Bikeway Gap (E. Winter Street to E. Central Avenue)**

**UIDN:119.000**

**Path Length:** 560'

**Paved Length:** 480'

**ROW required:** 432' of railroad ROW.

**Project Benefits:** Allows for a better connection for the end of the Springfield Branch Bikeway to E. Central Avenue, eastside neighborhoods.

**Notes:** Connects end of bikeway to E. Central Avenue through railroad ROW. Running path along rails will require two roadway crossings, one at E. Winter Street and another at E. Central Avenue. An engineering study should be conducted to determine risk to safety these crossings may pose given their proximity to traffic signals and the reduced visibility that occurs at rail crossings that are above the road surface.

**Phases required:** 1

**Cost estimate:** ~\$22,880.00 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width)

**Project Partner:** City of Delaware

### Springfield Branch, Alternative 1 (West End to Firestone Drive via Park Ave.)

**UIDN:120.100**

**Path Length:** 4563'

**Paved Length:** 3962'

**ROW required:** 2840' in addition to railroad crossing easement.

**Project Benefits:** This alternative will extend the west end of the Springfield Branch trail adding almost ½ mile to the overall length, better connecting Firestone Drive and the future City Recreation Center to the residents of eastern and southern Delaware. This alternative would better connect local users over sitting a path along the existing railroad corridor.

**Notes:** This project will require two ramps and a crosswalk at Curtis Street.

**Phases required:** 1 of 1

**Cost estimate:** ~\$172,347.00, plus the cost of improvements listed above.

**Project Partner:** City of Delaware.



### Springfield Branch, Alternative 2 (West End to Firestone Drive via RR ROW)

**UIDN:120.200**

**Path Length:** 2514'

**Paved Length:** 2574'

**ROW required:** 133' in addition to permission to place path next to active CSX railroad tracks.

**Project Benefits:** This alternative will extend the west end of the Springfield Branch trail adding almost ½ mile to the overall length, better connecting Firestone Drive and the future City Recreation Center to the residents of eastern and southern Delaware. This project differs from alternative 1 because it is shorter and is a relatively uninterrupted trail, requiring few if any curb cuts.

**Notes:** This project will require two railroad crossing (possibly signalized) as well as some earthwork to ramp up and down from the paths and some ROW. Two ramps and a crosswalk would be required at Curtis Street.

**Phases required:** 1 of 1

**Cost estimate:** ~\$109,359.00, plus the cost of improvements listed above.

**Project Partner:** City of Delaware.

### Troy Road, north (Extension of Troy Road Trail north of Smith Park)

**UIDN:121.000**

**Path Length:** 3390'

**Paved Length:** 3360'

**ROW required:** 3107'

**Project Benefits:** The project will continue the Troy Road path north past Smith Park into what is now Troy Township. This would be a long-range project, however, was included because it was identified by a stakeholder as being a priority path.

**Notes:** The project requires significant ROW easements as well as a railroad crossing that is safe for cyclists.

**Phases required:** 1 of 2

**Cost estimate:** ~\$146,160.00, plus railroad crossing improvements, ditch and/or culvert work.

**Project Partner:** City of Delaware.

**Troy Road / Smith Park Bikeway Connector****UIDN:122.000****Path Length:** 2438'**Paved Length:** 2438'**ROW required:** 50'**Project Benefits:** A project that will connect the Troy Road park and athletic fields to nearby neighborhoods and the city's bikeway and pedestrian infrastructure.**Notes:** Possibly the relocation of telephone poles or some ROW around each pole. Maybe some curb/drainage work.**Phases required:** 1**Cost estimate:** ~\$106,053.00, plus other project costs.**Project Partner:** City of Delaware.**US 23 South Bikeway Expansion, Phase 1 (Hawthorn Blvd to Stratford Road)****UIDN:123.010****Path Length:** 3415'**Paved Length:** 3222'**ROW required:** 2094'**Project Benefits:** Phase one is the first step in a long-range project to connect the Cheshire and Glenn Parkway area to the rest of the city of Delaware.**Notes:** Eight ramps, two un-signalized crosswalks (Hawthorn Blvd.) and two signalized crosswalks at (US 23 and Stratford Rd)**Phases required:** 1 of 2**Cost estimate:** ~\$139,156.50, plus signal improvements at US 23 and Stratford Rd, ramps, conversion costs for the sewer conduit bridge and ROW purchases. Most of the ROW is held by Stratford Ecological Center.**Project Partner:** City of Delaware.**US 23 South Bikeway Expansion, Phase 2 (Stratford to Cheshire Crossing)****UIDN:123.020****Path Length:** 4801'**Paved Length:** 4680'**ROW required:** 1000'**Project Benefits:** Phase two is the second step in a long-range project to connect the Cheshire and Glenn Parkway area to the rest of the city of Delaware.**Notes:** Path will require significant culvert, curb and earthwork to route within the right-of-way. Several large open culverts obstruct the path and will require the path to be routed around or cantilevered over these culverts to maintain connectivity. Three or four ramps and two crosswalks may be required for the project.**Phases required:** 2 of 2**Cost estimate:** ~\$203,580.00 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width) in addition to culvert, curb and earthwork, three or four ramps, the cost to convert the sewer service conduit bridge into a Bikepath bridge as well as any ROW expenses.**Project Partner:** City of Delaware.

### U.S. Highway 23 South Bikeway Expansion (Wal-Mart/Kroger Plaza: Phase 1, Alternative 1)

**UIDN:**124.011

**Path Length:** 1234'

**Paved Length:** 1196'

**ROW required:** 0'

**Project Benefits:** This alternative completes the first phase of connecting Stratford Woods subdivision and future U.S. Highway 23 South Bikeway. This phase connects the Delaware Community Plaza and the one mile long U.S. 23 South bikeway to the north. Combined with phase two, and the S. Sandusky Street and Olentangy Avenue projects, the total approximate length of path Mingo/U.S. Highway 23 Bikeway would be 3.45 miles. Alternative 1 expands the system in the most direct way possible, along U.S. Highway 23 where it ends at the beginning of phase 2.

**Notes:** This proposal provides a more direct route; however, it requires more earthwork than Alternative 2. The path would require a 350' long retaining wall with bikeway guardrail/fence. Both alternatives require other smaller sections of retaining wall as well as one crosswalks and two ramps.

**Phases required:** 1 of 2

**Cost estimate:** ~\$52,026.00, plus the cost of the retaining walls, guardrails, ramps, crosswalks/crosswalk signaling, and the wood bridge and/or culvert work.

**Project Partner:** City of Delaware.

### U.S. Highway 23 South Bikeway Expansion (Wal-Mart/Kroger Plaza: Phase 1, Alternative 2)

**UIDN:**124.012

**Path Length:** 1108'

**Paved Length:** 1010'

**ROW required:** 714' (ROW bisects 1 parcel (between two businesses, Sears Hardware and National City Bank) and trims a lot off of another (Best Western Delaware Inn). Expect ROW costs to be very high).

**Project Benefits:** This alternative completes the first phase of connecting Stratford Woods subdivision and future U.S. Highway 23 South Bikeway. This phase connects the Delaware Community Plaza and the 1 mile U.S. 23 South bikeway to the north. Combined with phase two, and the two phases of the S. Sandusky Street and Olentangy Avenue projects, the total approximate length of path Mingo/U.S. Highway 23 Bikeway would be 3.45 miles. Alternative 2 expands the system with a path that winds through several retail establishments before rejoining U.S. Highway 23 for phase 2.

**Notes:** Requires much less earthwork than Alternative 1 but requires very expensive right-of-way purchases. Both alternatives require other smaller sections of retaining wall as well as one crosswalks and two ramps.

**Phases required:** 1 of 2

**Cost estimate:** ~\$43,935.00, plus the cost of the above improvements and the purchase of additional right-of-way.

**Project Partner:** City of Delaware.



### US 23 South Bikeway Expansion (Wal-Mart/Kroger Plaza: Phase 2)

**UIDN:124.020**

**Path Length:** 924'

**Paved Length:** 818'

**ROW required:** 0'

**Project Benefits:** Achieves the second phase of connecting Stratford Woods subdivision and future U.S. Highway 23 South Bikeway to the Delaware Community Plaza and the 1 mile U.S. 23 South bikeway. Combined with phase two, and the two phases of the S. Sandusky Street and Olentangy Avenue projects, the total approximate length of path Mingo/U.S. Highway 23 Bikeway would be 3.45 miles. This component connects Stratford Woods subdivision and potential path expansions to the north of the subdivision. This pathway could be through the existing center rather than along the frontage of US23 to match up to Phase 1, Alternative 2.

**Notes:** Four crosswalks, eight ramps, a retaining wall work, culvert, curb and guardrail work.

**Phases required:** 2 of 2

**Cost estimate:** ~\$35,583.00, plus the cost of four crosswalks with cyclist path signals, eight ramps, limited retaining wall work, culvert, curb and guardrail work.

**Project Partner:** City of Delaware.



### US 36 / SR 37 Expansion (The Point to Glennwood Commons)

**UIDN:125.000**

**Path Length:** 2802'

**Paved Length:** 2375'

**ROW required:** 2163' (all parcels without roadway easement subtracted from parcels)

**Project Benefits:** Connects east Delaware to the new Glennwood Commons Shopping Center to pedestrians and cyclists.

**Notes:** Three ramps, two crosswalks, a pedestrian island (preferred) at the SR 521 and US 36 / SR 37 intersection. A culvert crossing for a small stream along US 36 / SR 37.

**Phases required:** 1

**Cost estimate:** ~\$103,312.50, plus the cost of culvert work, ramps, and crosswalks at the SR 521 and US 36 / SR 37 intersection.

**Project Partner:** City of Delaware.

### Lehner Woods Blvd / US 36 Bikeway Gap

**UIDN:126.000**

**Path Length:** 48'

**Paved Length:** 48'

**ROW required:** none

**Project Benefits:** The 48' section connects two other nearly ¼ mile segments, allowing a combined length of about ½ a mile of path.

**Notes:** Route Path around utility boxes on corner of US 36 and Lehner Woods Blvd.

**Phases required:** 1

**Cost estimate:** ~\$2,088.00 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width)

**Project Partner:** City of Delaware

### W. Williams Street Bikeway Expansion, Phase 1 (Houk Road to Medrock P/L)

**UIDN:**127.010

**Path Length:** 897'

**Paved Length:** 897'

**ROW required:** 897' (linear feet)

**Project Benefits:** Developer contribution will permit the city to complete the rest of a bikeway along U.S. Highway 36 and potentially creating an almost 1.7 mile (9030') long loop. The loop requires ~1950' of Bikepath on U.S. Highway 36 (this improvement, first of a two phase project) as well as the 660' Carson Farms Bikeway Gap.

**Notes:** ROW owned by Medrock LLC and has yet to have roadway easement subtracted from their parcel. Path requires no special earthwork, ramps or crosswalks.

**Cost estimate:** ~\$39,019.50 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width)

**Project Partner:** Medrock LLC

### W. Williams Street Bikeway Expansion, Phase 2

(Medrock P/L to Meadows at Carson Farms)

**UIDN:**127.020

**Path Length:** 1048'

**Paved Length:** 1023'

**ROW required:** 209' (linear feet)

**Project Benefits:** Developer contribution will permit the city to complete the rest of a bikeway along U.S. Highway 36 and potentially creating an almost 1.7 mile (9030') long loop. The loop requires ~1950' of Bikepath on US Highway 36 (this improvement, second of a two phase project) as well as the 660' Carson Farms Bikeway Gap.

**Notes:** ROW owned by a residential owner and has yet to have roadway easement subtracted from their parcel. Path crosses at least a dozen driveways and needs two ramps, one crosswalk.

**Cost estimate:** ~\$44,500.00

**Project Partner:** City of Delaware

### Carson Farms / Lexington Drive Expansion

**UIDN:**128.000

**Path Length:** 2135'

**Paved Length:** 2048'

**ROW required:** 0'

**Project Benefits:** The project connects neighborhoods off of Lexington Drive with neighborhoods off Carson Farms road. To be constructed concurrently with a future roadway project to bridge Delaware Run, connecting these streets together.

**Notes:** This project requires a bridge or a wide culvert (for the roadway and bikeway) to be constructed across Delaware Run.

**Phases required:** 1 of 1

**Cost estimate:** ~\$89,088.00, plus the cost of a bridge or culvert work. Bikeway would have to cross roadway at some point to allow both to fit within existing ROW.

**Project Partner:** City of Delaware.

**Olentangy Avenue: (Optional Stratford Road Connection)****UIDN:129.000****Path Length:** 915'**Paved Length:** 769'**ROW required:** 0'**Project Benefits:** This project will provide a connection for cyclists to travel from the Olentangy Avenue path under U.S. Highway 23 and south on Stratford Road.**Notes:** There may not be sufficient space under the overpass for a bikeway and two lanes of travel.**Phases required:** 1 of 1**Cost estimate:** \$56,681 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width) in addition to roadwork and/or retrofitting to allow the path to travel under the highway overpass**Project Partner:** City of Delaware.**Stratford Road: (Spring Lake Ct. to US 23)****UIDN:130.000****Path Length:** 9860'**Paved Length:** 9302'**ROW required:** 0'**Project Benefits:** This project will provide a connection for cyclists to travel from the Olentangy Avenue path south on Stratford Road to US 23.**Notes:** Additional right-of-way may be needed along Stratford Rd.**Phases required:** 1 of 1**Cost estimate:** \$40,464 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width) in addition to roadwork and/or additional ROW and easements.**Project Partner:** City of Delaware / Delaware County / Private Developers**US 23 Southeast: (Delaware Plaza future intersection south to Stratford Road.)****UIDN:132.000****Path Length:** 3818'**Paved Length:** 3818'**ROW required:** 0'**Project Benefits:** This project provides a potential alternative connection along the east side of US23 from a re-worked future intersection and traffic signal south to Stratford Rd. It may be more desirable to provide pathways along backage roads or even to the Stratford Rd. pathway via multiple east-west connections**Notes:** ROW, County and Township cooperation, and/or easement purchase.**Phases required:** 1 of 1**Cost estimate:** \$16,608 (\$4.35/sqft, Liberty Twp. Asphalt, 10' width) in addition creek crossings and bridges.**Project Partner:** City of Delaware / Delaware County / Private Developers.

### Proposed Improvement Projects to Supportive Sidewalk Infrastructure

In the process of preparing this plan, department review and prioritization exercises revealed a number of gaps in the City's sidewalk infrastructure. These projects have been presented for consideration apart from improvements to the Bikeway network in the interest of advancing pedestrian connectivity.

#### E. Williams Street Sidewalk Connector Expansion (Channing Street to the Point)

**UIDN: 1.000**

**Path Length:** 2211'

**Paved Length:** 2136'

**ROW required:** 0'

**Project Benefits:** This improvement allows for cyclists to use the existing sidewalk as a bikeway, permitting cyclists to travel in opposite directions on the same sidewalk. This will allow for a better connection between the Point and E. Winter Street which could easily be converted as a "Share The Road" bike route connecting the east side neighborhoods with downtown Delaware to the West and Glennwood Commons and Kensington Place to the East.

**Notes:** Widen and repair existing 5' or 5'6" sidewalk to 8' to allow two-way cyclist traffic between the intersection of E. Williams and Channing streets and the Point. Sidewalk widening, when combined with the E. Winter Street share-the-road route, will allow for improved access between downtown Delaware, Eastside neighborhoods and the Glennwood Commons Shopping Center and the Kensington Place subdivision.

**Phases required:** 1

**Cost estimate:** ~\$44,856.00 (concrete, \$7.00/SF) in addition to repair costs for existing sidewalk sections and tree removal.

**Project Partner:** City of Delaware.

#### Liberty Road Sidewalk Connector Gap (north)

**UIDN: 2.000**

**Path Length:** 293'

**Paved Length:** 257'

**ROW required:** 0' (linear feet)

**Project Benefits:** Connects sidewalk on Liberty Road with sidewalk on Belle Avenue, enabling users to go from Liberty Road to S. Sandusky Street and the US Highway 23 corridor and downtown Delaware.

**Notes:** Appears to be a simple project connecting sidewalk on Liberty Road to sidewalk on Belle Avenue.

**Phases required:** 1

**Cost estimate:** ~\$8,995.00 (\$7.00/SF, 5' wide concrete path)

**Project Partner:** City of Delaware

**Liberty Road Sidewalk Connector Expansion (south)****UIDN: 3.000****Path Length:** 4627'**Paved Length:** 4564'**ROW required:** 50'**Project Benefits:** Extends sidewalk from where the sidewalk ends south of Silver Maple Drive and Liberty Road and a park located at the intersection of Hawthorn Boulevard and Liberty Road.**Notes:** Ten ramps, seven crosswalks (Beech: two ramps, one crosswalk; Pollyanna/Kesslebrooke: four ramps, four crosswalks; Hull Drive: two ramps, one crosswalk; Somerset: two ramps, one crosswalk). Needs guardrail under US 42 bridge to separate path from Liberty Road. Paved length includes approximately 108' of sidewalk needed to connect the path to existing sidewalks on three intersecting streets.**Phases required:** 1 (though project could be completed in smaller phases if needed)**Cost estimate:** ~\$159,740.00 (\$7.00/SF, 5' wide concrete path) If completed as a Bikepath asphalt path the cost would be ~\$198,534.**Project Partner:** City of Delaware.**Schultz Elementary Sidewalk Connector Expansion (south)****UIDN: 4.000****Path Length:** 924'**Paved Length:** 920'**ROW required:** 0' (linear feet)**Project Benefits:** This path allows pedestrians and cyclists to travel around Schultz Elementary, allowing for better pedestrian connectivity between the neighborhoods and streets separated by the school including Cobblestone Drive, Willow Run Lane, Penick Avenue, and Marvin Lane.**Notes:** Simple project. Work with school district on path.**Phases required:** 1**Cost estimate:** ~\$32,200.00 (\$7.00/SF, 5' wide concrete path)**Project Partner:** Delaware City School District or City of Delaware**Schultz Elementary Sidewalk Connector Gap (north)****UIDN: 5.000****Path Length:** 587'**Paved Length:** 587' X 5' wide**ROW required:** 0' (linear feet)**Project Benefits:** Helps to connect the elementary school to the sidewalks in the surrounding neighborhood. The path allows pedestrian and cyclist to travel between sidewalk segments on Willow Run and Applegate lanes without the need to either walk in the grass or use the driveway leading to the elementary school.**Notes:** A set of ramps may be needed to permit crossings of the elementary school access road (extension of Applegate Road).**Phases required:** 1**Cost estimate:** ~\$20,545.00 (\$7.00/SF, 5' wide concrete path)**Project Partner:** Delaware City Schools or City of Delaware

### **Kensington -- US 36/SR 37 Sidewalk Gap (north)**

**UIDN: 6.000**

**Path Length:** 733'

**Paved Length:** 564' X 5' wide

**ROW required:** 0' (linear feet)

**Project Benefits:** Connects the Bowtown Bikeway and Kensington Place subdivision with existing sidewalk that extends north along SR 521 from its intersection with US Highway 36 / State Route 37. With the completion of this project, Kensington Place residents should have easier access to the nearby Glennwood Commons Shopping Center.

**Notes:** Requires three ramps, a pedestrian island, a user activated warning light for bikers to cross SR 521 at Bowtown Road.

**Phases required:** 1

**Cost estimate:** ~\$19,740.00 (\$7.00/SF, 5' wide concrete path), in addition to the items listed above.

**Project Partner:** Land developers, City of Delaware

### **W. Central Street Sidewalk Connector Expansion (Buehlers to Houk Road)**

**UIDN: 7.000**

**Path Length:** 3632'

**Paved Length:** 3523'

**ROW required:** 1773'

**Project Benefits:** This proposal is to install sidewalk between 1034 W Central Street and the intersection of W. Central Street and Houk Road.

**Notes:** Route requires five ramps, two culverts to cross, limited retaining wall work, and fences.

**Phases required:** 1

**Cost estimate:** ~\$123,305.00 (\$7.00/SF, 5' wide concrete path) in addition to the cost of ROW, ramps, retaining walls, fences, culvert crossings (bridges or closed culverts).

**Project Partner:** City of Delaware.

### **W. Williams Street Sidewalk Connector Expansion (Section 1)**

**UIDN: 8.000**

**Path Length:** 784'

**Paved Length:** 784'

**ROW required:** 544' (linear feet)

**Project Benefits:** This section of sidewalk completes a gap in sidewalk between Applegate Lane and Penick Avenue on the south side of W. William Street, a necessary step to connect areas west of Applegate to downtown and central Delaware.

**Notes:** Simple project. Most of right-of-way required is from parcels that have yet to have the roadway easement separated from their parcels.

**Cost estimate:** ~\$27,440.00 (\$7.00/SF, 5' wide concrete path)

**Project Partner:** City of Delaware

**W. William Sidewalk Sidewalk Connector Expansion (Section 2)****UIDN: 9.000****Path Length:** 1368'**Paved Length:** 1272'**ROW required:** 365'

**Project Benefits:** This section of sidewalk completes a gap in sidewalk between New Market Drive and Carson Farms Boulevard on the south side of W. William Street, a necessary step to connect areas west of New Market Drive to downtown and central Delaware.

**Notes:** A simple project. Needs two ramps and crosswalk

**Phases required:** 1**Cost estimate:** ~\$44,520.00 (\$7.00/SF, 5' wide concrete path)**Project Partner:** City of Delaware.**W. William Sidewalk Sidewalk Connector Expansion (Section 3)****UIDN: 10.000****Path Length:** 1915'**Paved Length:** 1915'**ROW required:** 171'

**Project Benefits:** This section of sidewalk completes a gap in sidewalk between Carson Farms Boulevard and the Trillium Condominium development, an improvement that would improve access to pedestrian infrastructure on the north side of US Highway 36.

**Notes:** An alternative to W. William street Bikepath Extension. Some ROW will be required. Ground truth needed. No other major issues.

**Phases required:** 1**Cost estimate:** ~\$67,025.00 (\$7.00/SF, 5' wide concrete path)**Project Partner:** City of Delaware.**Firestone Sidewalk: (Lobdell to Delaware drives)****UIDN: 11.000****Path Length:** 893'**Paved Length:** 821'**ROW required:** 893'

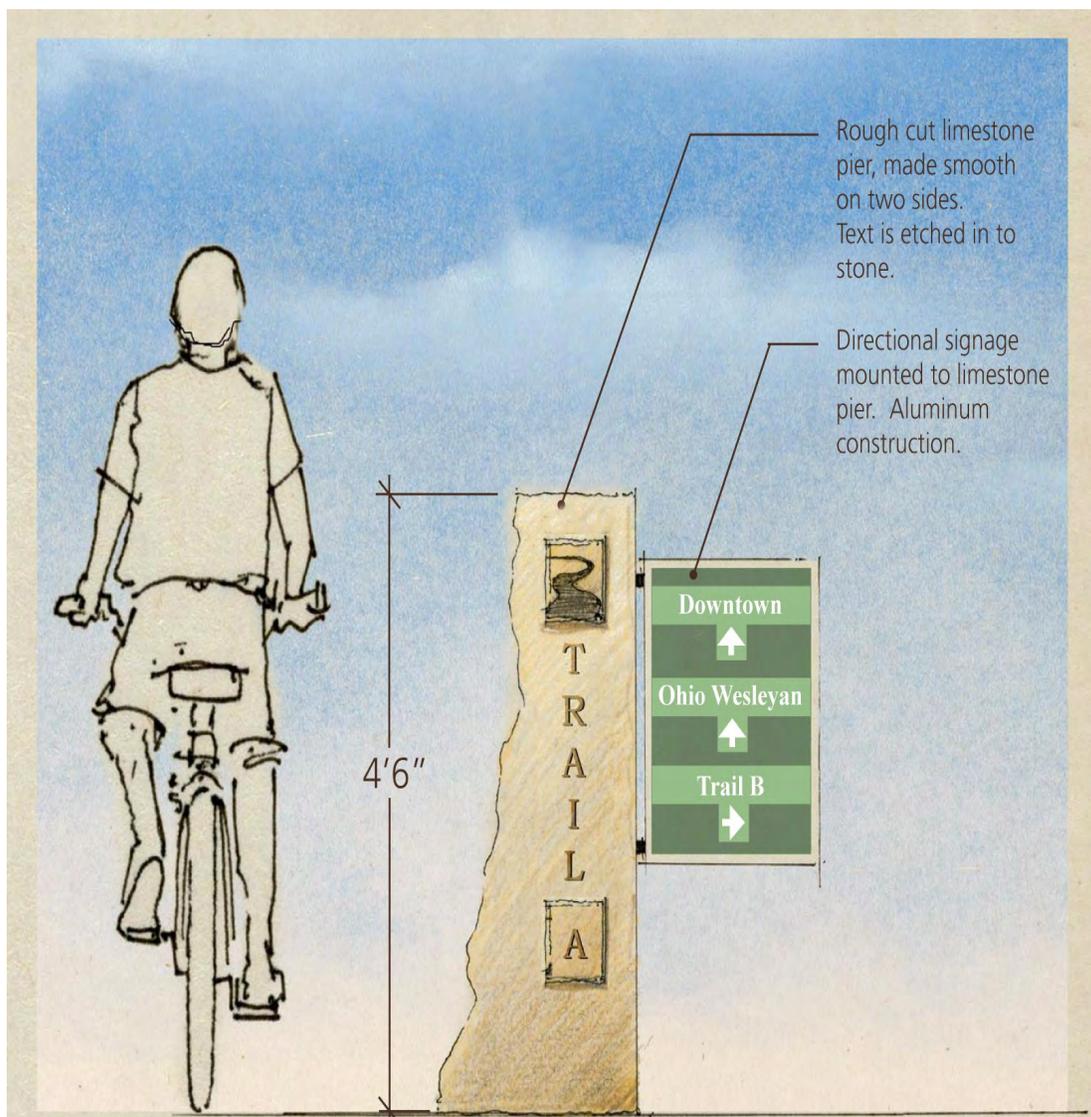
**Project Benefits:** Completion of this section of sidewalk is a necessary step toward connecting the Springfield Branch western extension to points westward on Firestone and Boulder drives—eventually connecting to the future city recreation center.

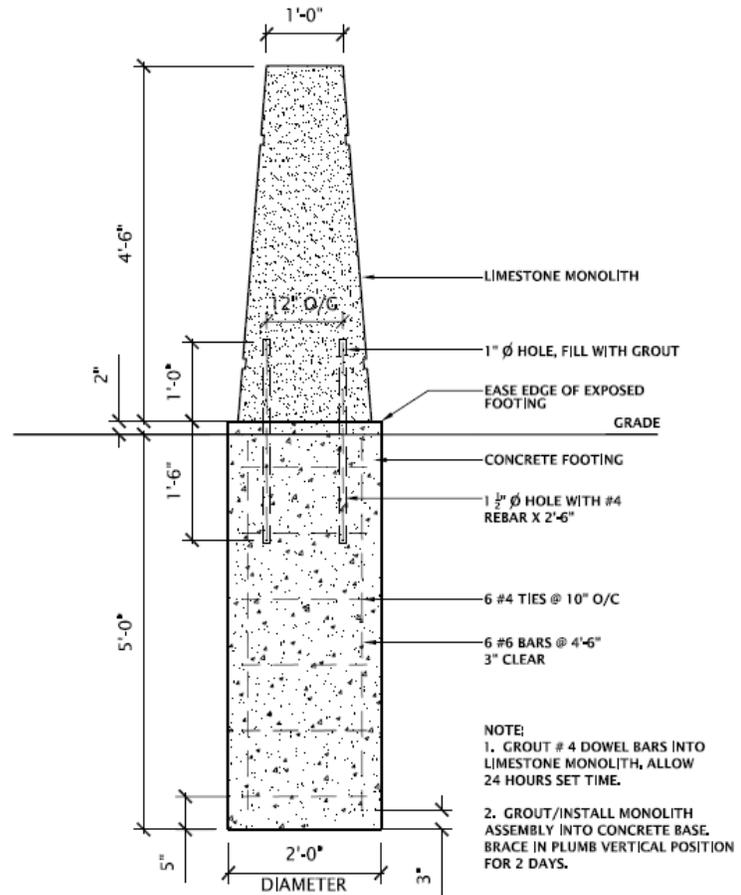
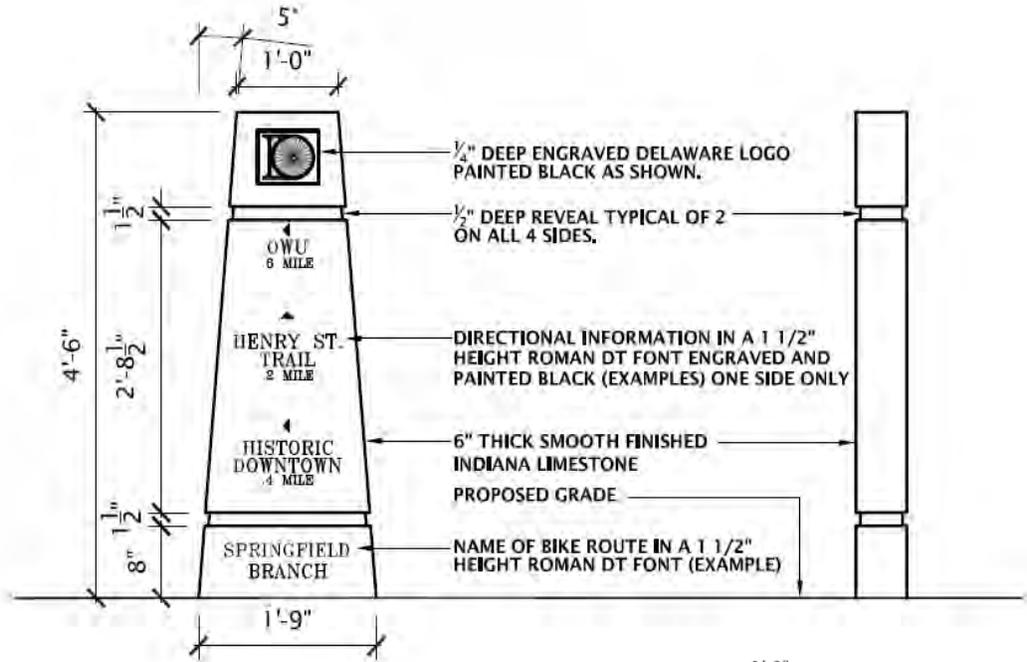
**Notes:** Will be constructed as new homes are built on this section of Firestone Drive.

**Phases required:** 1**Cost estimate:** ~\$35,723.50 (\$7.00/SF, 5' wide concrete path)**Project Partner:** City of Delaware.

## Appendix F: Bikeway Wayfinding

This Plan suggests that one way of improving the bikeway system is to implement a wayfinding standard system-wide. Several conceptual designs were developed for the city and are included in this appendix section. There is a sketch of a limestone path marker, schematics for an alternative limestone monolith, and a marker post are presented. Further research will be required to develop concepts that are attractive and cost effective for cyclists.









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# **2010 Bikeway Plan**

City of Delaware, Ohio

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