

CHAPTER III. THE BICYCLE NETWORK

INTRODUCTION

The Bicycle Network proposed in this plan is a 445-mile system of on-street bicycle facilities and routes, shared-use trails, and key connecting paths. All of these facility types will be defined and discussed in this chapter.

The *on-street* Bicycle Network is comprised of striped bicycle lanes, shared lane markings and other on-street facilities. It also includes connecting streets (which can be used by bicyclists “as is”) and recommended intersection improvements.

The *off-street* Bicycle Network is comprised of shared use paths (multi-use trails), sidewalks designated for bicycle use, potential rail-with-trail corridors and connector paths.

For implementation purposes, all recommended facilities and improvements are grouped in phases (see Table 4):

- Near Term: June 2010 – December 2011;
- Phase I: 2010-2015¹;
- Phase II: 2016-2020; and
- Phase III: 2021-2025 (also includes projects with unknown timing.)

Specific *Near Term* projects have been identified to ensure that once approved, this plan will “hit the ground running.” Many projects in the plan are relatively low in cost, and even in tight budget times, can be implemented with little additional cost as a part of budgeted resurfacing or other street improvement projects.

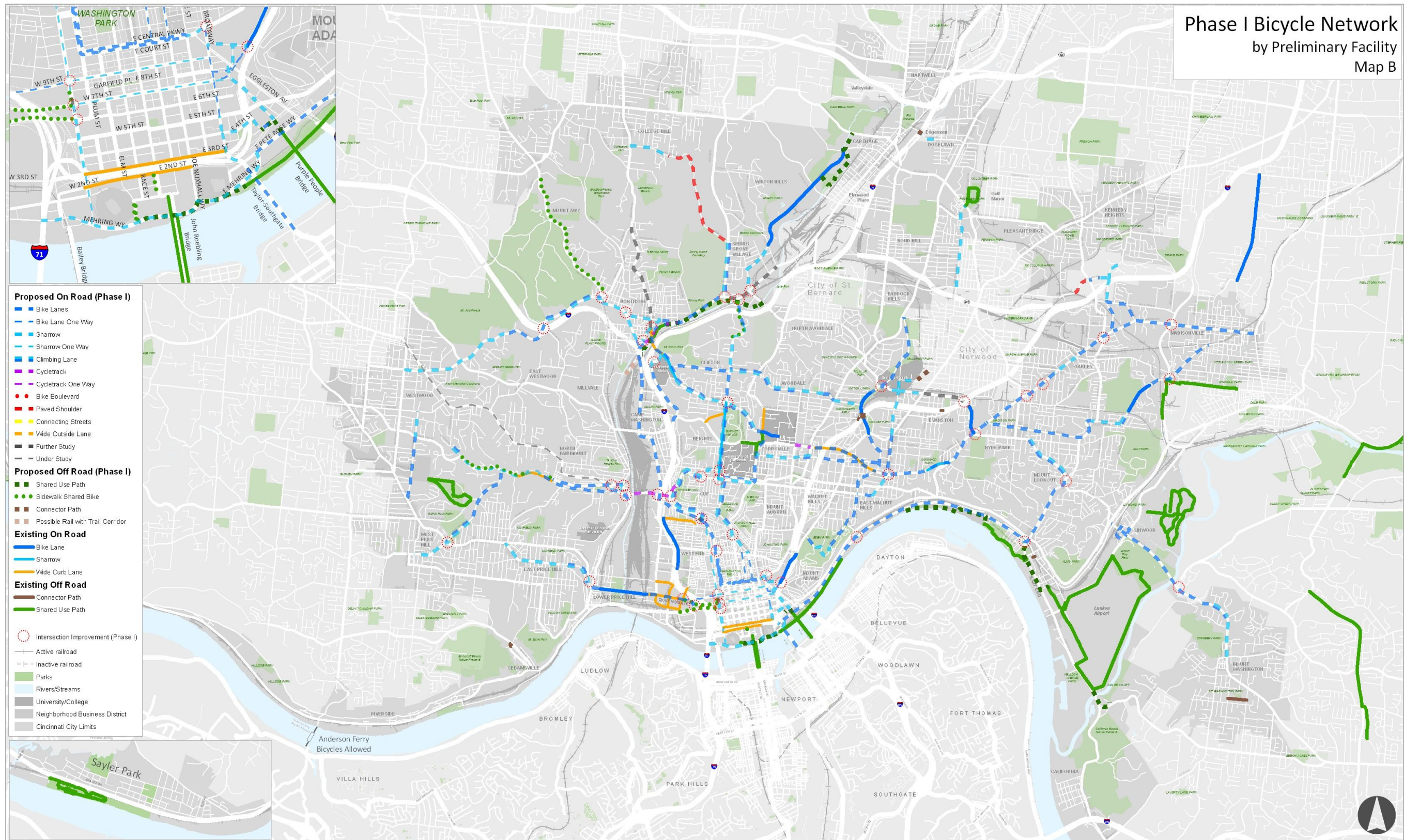
The *Near Term* phase totals 14 miles and includes a combination of bike lanes and sharrows on Spring Grove Avenue (3.7 mi.), Madison Road (6.1 mi.) and Riverside Drive (3.9 mi). Phase I overall, includes a wide variety of facilities that will create a continuous and usable network of improvements (see Map B on page 27).

Recommended Bicycle Network					
	Existing Facilities	Preliminary Bicycle Facility Recommendations (in miles)			
On-Street Facilities		Phase I	Phase II	Phase III	Grand Total
Bike Lane	5.4	42.3	36.0	30.2	113.9
Sharrow	1.8	23.1	39.0	41.4	105.3
Climbing Lane	0.0	9.9	10.3	3.6	23.8
Paved Shoulder	NA	1.8	1.1	8.3	11.1
Cycletrack	0.0	1.4	2.9	1.6	5.9
Bike Boulevard	0.0	0.0	0.5	0.4	0.8
Wide Outside Lane	6.1	0.0	0.6	0.0	6.7
Connecting Street	NA	5.4	21.4	18.9	45.7
Under Study	NA	4.0	0.9	0.0	4.9
Further Study	NA	3.2	3.3	17.9	24.4
TOTAL:	13.3	91.0	116.0	122.3	342.6
Off-Street Facilities		Phase I	Phase II	Phase III	Grand Total
Shared Use Path	18.8	6.2	10.6	29.2	64.8
Sidewalk Shared Bike	0.0	5.2	2.4	0.3	7.9
Connector Path	1.0	0.6	0.6	1.1	3.3
Potential Rail with Trail	0.0	0.4	3.6	22.7*	26.7
TOTAL:	19.8	12.4	17.2	53.3	102.7
* 3.6 mi. in Phase 3 + 19.1 mi.: unknown timing.					
GRAND TOTAL:	33.1	103.4	133.2	175.6	445.3

Table 4: Recommended Bicycle Network

¹ Includes the Near Term timeframe.

Phase I Bicycle Network
by Preliminary Facility
Map B



Cincinnati Bicycle Transportation Plan

June 2010



Map B: Phase I Network by Preliminary Facility

Map C, available only in poster size, shows the entire Bicycle Network, i.e. all three phases.²

HOW WAS THE NETWORK DEVELOPED?

As described in Chapter I, the recommended Bicycle Network resulted from an analysis of more than 350 miles of streets in the city. This analysis inventoried the study network based on existing suitability for bicycling as well as the potential for installing bicycle facilities or improving conditions through some type of roadway improvement.

Using the data in the inventory, streets and routes were selected for the Network based on 1) their contribution to system-wide objectives, and 2) how they measured up to specific route selection criteria. These two sets of criteria are described below.

System-wide Network Objectives

- Achieve thorough geographic coverage of the City;
- Provide the best possible safety in traffic;
- Where possible, overcome barriers and street discontinuities;
- Where needed and feasible, provide parallel routes that serve different types of cyclists, such as an improved arterial for skilled and advanced cyclists and long distance commuters/recreational riders; and a quiet, side-street route for novice and slower speed cyclists who may be traveling shorter distances;
- Ensure that routes meet bicyclist's expectations for continuity, directness, convenience, and linkage with other routes.

Route Selection Criteria

In addition to the overall objectives, each of the routes studied was selected (or not selected) for network designation for a particular reason or set of reasons, from among the following factors:

- Contribution to providing bicycle access to important destinations, such as commercial districts, shopping areas, employment centers, transit stations, parks, trails, cultural institutions, schools, libraries, etc;
- Relatively low traffic volumes and speeds, generally comfortable for bicycling without major improvements;
- Existing street (or right-of-way) width sufficient for making improvements;
- Relative ease with which a bicycle improvement (lane, striping, pavement marking, signing, curb ramp, short connecting path) could be implemented;
- Opportunity for improvement exists because of already scheduled capital improvement project;



² Map C and other maps in poster-size can be viewed on the DOTE website or at the offices of the Department of Transportation and Engineering.

- Complementarity to the off-road trail network; i.e. creates a seamless on-road/off-road bicycle travel corridor;
- Advantages the route offers in circumventing barriers such as waterways, major highways, inaccessible bridges, railroads, large institutions, forests, or steep terrain;
- Connectivity provided to highly isolated neighborhoods;
- Connectivity provided to important communities and destinations outside the city;
- Connectivity provided between Cincinnati neighborhoods, but across neighboring jurisdictions;
- Recommended by the bicycling public, or city staff;
- Topography;
- Primary street function is to provide access to limited access highways;
- Heavy use by trucks and large vehicles;
- Presence of unconventional, difficult-to-navigate, or difficult-to-modify intersections along the route;
- Presence of a viable, or better, alternative route that could serve the same destinations.

WHY DESIGNATE CERTAIN STREETS AS COMPONENTS OF A BICYCLE NETWORK?

By designating select streets as part of a Bicycle Network, special attention can be focused on maximizing their potential to serve bicycle travel.

It is important to note, that except for highways where bicycle use is specifically prohibited, all streets can and will be legally used by bicyclists. Moreover, the City's baseline approach to bicycle accommodation is to generally maintain and manage all streets legally open to cyclists in such a way that cyclists can safely use them.

By designating a specific Bicycle Network, the City identifies where enhancement, over and above the baseline level of care, should be provided. More specifically, adopting the Network recommended by this plan will accomplish three key transportation policy objectives:

- To ensure that streets that currently have conditions that make bicycling comfortable, safe and attractive today, do not lose these conditions in the course of ongoing and routine roadway planning, improvement and maintenance;
- To indicate which streets have significant opportunities to be improved for bicycling and ensure that when the opportunities arise, they are not passed by.
- To indicate which streets are particularly difficult for bicycling, but are needed in the Bicycle Network nonetheless to provide a comprehensive and continuous system that serves all bicycle transportation needs. To make these routes suitable for bicycling special study and design may be necessary.



BICYCLE FACILITIES AND ACCOMMODATIONS

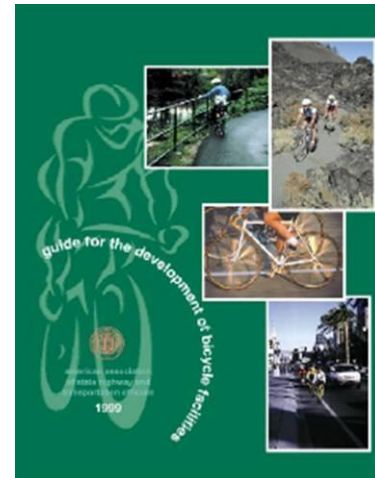
To facilitate a safe and continuous Network across the wide range of street types that exist in the City, a variety of bicycle facilities and accommodations are required. On-street bicycle facilities will include bicycle lanes, shared use pavement markings, striped shoulders, and a number of other accommodations. Additionally, bicycle-related safety, regulatory and warning signs and a variety of other design features may be used to improve safety and better accommodate cyclists in traffic.

Off-street facilities will include shared use paths (trails), connector paths, a few specially designated sidewalks and upgrades to or replacement of highway/railroad over- and underpasses.

A focus of this plan is developing facility applications for the City's arterial and collector streets. City policy shall be to provide the greatest level of cyclist comfort and safety that is feasible from an engineering and cost effectiveness point of view.

The following section of the plan will describe the range of facilities that are included in the preliminary recommendations for the Bicycle Network. In general, each type of on-street bicycle facility offers a different level of comfort to bicyclists relative to motor vehicle traffic. The following list is ordered from greatest level of comfort to least.

1. Cycle Tracks
2. Buffered Bicycle Lanes
3. Standard Bicycle Lanes
4. Climbing Lanes
5. Striped Shoulders
6. Shared Lane Markings (Sharrows)
7. Wide Outside Lanes
8. Sharing a standard travel lane.



The facilities recommended in this plan are referred to as *Preliminary Facility Recommendations*. As the City moves forward to implement a bicycle facility on a particular section of roadway further investigation may be required; the facility recommendation in the plan will serve as a starting point. In cases where “higher grade” bicycle facilities are feasible at little or no extra cost they should be implemented. In cases where the recommended facility proves infeasible, “lower grade” facilities may need to be provided until such time as they can be upgraded. When considering facility types for a particular street it is important to keep in mind three key objectives: a) providing bicyclists using the route a level of comfort that addresses existing and future traffic conditions, b) providing a facility that will attract and serve the desired levels of bicycle use on the route and c) achieving overall Bicycle Network continuity needs.³

ON-STREET NETWORK: FACILITY TYPES

Following is a description of recommended on-street facilities and accommodations. The first group are those that are generally appropriate for urban arterial and collector

³ It is important to note that the retrofitting of bicycle facilities into urban streets is both an art and a science. The needs of all street users and legal vehicles should be taken into consideration. Maximizing the potential safety of the most vulnerable users (pedestrians and bicyclists) should be the highest priority.

streets (those that carry the most traffic and provide the greatest level of connectivity across the city). The second group of facility types/accommodations typically are applied to minor or local streets in the Bicycle Network. In many cases, within a basic facility type there are design variations; where these variations are recommended for Cincinnati's Network, they are described. Specific design guidelines for these and other bicycle facilities are provided in a variety of documents published by AASHTO and various city and state Departments of Transportation.

FACILITY TYPES AND ACCOMMODATIONS FOR ARTERIAL AND COLLECTOR STREETS

Cycle Track

A cycle track is a bicycle path along a street or highway that is physically separated from motor vehicle traffic. It is distinct from the sidewalk as well. It is not a shared use path because it is not intended for pedestrian use. It is not a bicycle lane because it is separated from motor vehicle traffic by more than a white line; additional physical separation may be provided by a curb, raised median, parking lane, planting buffer or bollards. Cycle tracks are common in European cities and parts of Canada, and are being installed at increasing rates in U.S. cities. Cycle tracks can be two-way bicycle-only paths, or one-way facilities, with a cycle track provided on each side of a two way street.



Cycle Track

Bike Lane

A bike lane is a portion of the roadway that has been designated by striping and pavement markings for the exclusive use of bicyclists. Use of special signing for bike lanes is optional. Bike lanes are for one way bicycle travel and are typically located on each side of a roadway (except on one way streets). They are intended to accommodate bicycle travel in the same direction as adjacent motor vehicle traffic. The minimum width for a bicycle lane is 5 feet for curbed streets, 4 feet for streets without curbs.



Standard Bike Lane

This plan recommends use of a number of variations on traditional bike lanes, including buffered bike lanes, bike lanes in one direction combined with sharrows in the other direction, and experimentation with "floating" bike lanes, which are used on arterials where parking is allowed in the right lane except during peak hours when it serves as a travel lane.



Buffered Bike Lane

Climbing Lane

A climbing lane is a single bicycle lane on a sloped street that serves the direction of travel that is uphill. Typically, a *sharrow* is placed on the downhill side. The bicycle lane/*sharrow* combination is used on streets where there is not sufficient road space (10 feet) to provide two dedicated bicycle lanes, one in each direction. The placement of a



bicycle lane in the uphill direction provides the greatest amount of protection from traffic for the typical uphill cyclist, who will be moving at a much slower rate of speed. The cyclist traveling downhill can likely keep up with traffic (20-25 mph) and can safely occupy the full downhill travel lane without impeding traffic.

Shared Roadway Pavement Marking “Sharrow”

Motor vehicle/bicycle sharing of the travel space can be emphasized by using special shared roadway pavement markings or *Sharrows*. *Sharrows* can be helpful on streets where there is insufficient space to add bicycle lanes and the posted speed limit is not above 35 mph. The *sharrow* marking also assists with wayfinding and can be used in conjunction with signs to help delineate specific bicycle routes.



The sharrow has been tested for both driver and cyclist understanding, however Cincinnati may choose to include signs in conjunction with the sharrow that clarify its meaning that bicyclists and motorists are to share the travel lane. Where sharrows are placed in travel lanes that are too narrow for bicyclists and motorists to operate side-by-side, installation of BIKES MAY USE FULL LANE sign(s) should be considered.

Striped Shoulder

A striped shoulder can be a useful way to accommodate bicyclists where there is insufficient space for a bicycle lane. In urban areas, they are most commonly used on the outskirts where roadway contexts are rural in nature. A striped shoulder of 3-4.5 feet provides a usable space for a cyclist. As compared to providing a wide outside lane, striping a ten-foot travel lane and shoulder will keep vehicle speeds in check and offers a better accommodation for the cyclist. In select cases, a striped shoulder may be preferred to a bicycle lane because bicycle use is expected to be low or intermittent and there is a need for a *multi-functional*, rather than *preferential* space on the side of the street.

Wide Outside Lane

On an arterial or collector street, providing a wide outside lane without the sharrow marking offers the lowest level of bicycle accommodation, but is a valued and useful accommodation none-the-less. An outside lane must be 13 to 14 feet wide to be considered notable as a bicycle accommodation. Following are two examples where a wide outside lane is an appropriate accommodation:

- a. A sharrow cannot be used due to a speed limit of 40-45 mph, and a bicycle lane or striped shoulder cannot be provided;
- b. A sharrow cannot be used because the outside lane is both a parking lane and peak hour travel lane. Providing a wide outside lane is better for cyclists than dividing the available space equally among all travel lanes. Furthermore, in this situation, the wide outside lane would make this arterial street a candidate for experimentation with the *floating bicycle lane*.⁴



ACCOMMODATIONS FOR LOCAL AND NEIGHBORHOOD STREETS

Bicycle Boulevard

A bicycle boulevard is a treatment generally applied to a neighborhood street that parallels an arterial or collector roadway for some distance. The goal is to prioritize bicycle travel on the minor street while at the same time discouraging non-local motor vehicle use of the street. Traffic calming techniques are used to slow motor vehicle speeds and limit motor vehicle access. While these treatments improve the conditions for on-street bicycling



they also eliminate cut-through traffic and create a safer, more livable street for residents. Treatments may include entry restrictions, street narrowing, widening of planting buffers, chicanes, small traffic circles or other traffic calming measures.

Connecting Street

Connecting Streets are streets where bicyclists can be well-served by sharing the travel lanes with motor vehicles. Typically, these streets have low traffic volumes and/or low motor vehicle speeds. These streets do not need

⁴ The far right lane of an arterial street with peak hour restricted parking can be designed as a *floating bicycle lane*—by placing sharrows in the lane on both the right and left sides of the lane. Cyclists would use the far right side of the lane at peak hour, and the left side, adjacent to parked cars, in the off peak periods.

dedicated bicycle facilities or special striping to be bicycle-friendly.

SIGNED BICYCLE ROUTES

A signed route is a continuous set of streets and roads where wayfinding signs are installed to assist bicyclists with navigation between particular destinations. They can also be used to direct cyclists to use particular streets which generally have better conditions for bicycling.⁵ This is typically done in locations where cyclists might not otherwise know about or find the preferred route.

Signed routes may include bike lanes, sharrows, bicycle boulevards or other accommodations to improve the quality of bicycling conditions on the route. In Cincinnati, all future Signed Bike Routes will provide bicyclists with distance and destination information.

As Phase I of the Bicycle Network is implemented, a set of *spine routes* will be established that provide directional guidance, destination and distance information that is easy to follow for all cyclists, including novice bicyclists, new bicycle commuters, new city residents, tourists, and long-time Cincinnati residents. It is intended that this route system be designed and implemented to accomplish the following objectives:

- Provide routes that touch every part of the city and serve the most important destinations needing bicycle access and wayfinding guidance.
- Contribute to the physical and visual presence of bicycle accommodations on the city street and roadway system.
- Provide a distinct and citywide feature of the bicycling infrastructure that can be called out in encouragement materials and campaigns as an aspect of the City's efforts to make bicycle transportation convenient, prominent and normative.



INTERSECTION IMPROVEMENTS

Intersections present a particular challenge for bicyclists. Cincinnati has a number of complex intersections that are part of the Bicycle Network because 1) they cannot be avoided, or 2) creation of a detour would require a major inconvenience for bicyclists, who would be unlikely to use it.

Many of these intersections will require special design considerations. Their unique nature suggests that a wide variety of solutions may be employed, such as the following:

- Bicycle signal heads
- Advance bicycle boxes



⁵ It should be noted that the primary purpose of bike route signs is not to alert motorists of the likely presence of bicyclists. Bike routes signs alone do not provide a higher grade of operating conditions for cyclists.

- Bicycle detection technology to actuate traffic signals
- Adjustment of signal phases and timing
- Special striping patterns
- New curb ramps and crosswalk striping
- Curb extensions
- Allowing bicyclists to use sidewalks in discrete locations
- Signs communicating safety precautions, operational directives and wayfinding

Intersections needing improvements are circled on maps B-E. Appendix A provides a list of these intersections by implementation phase, which has been assigned based upon the phasing of the route within which it is located.

In addition to all of the on-street facilities and treatments described above, there are other accommodations that are being used in U.S. cities that are still in the experimental phase. Some of these facilities may be useful in Cincinnati; however, it is expected that this will not be the case until later phases of plan implementation. Examples of such facilities/treatments include--contra-flow lanes, colored bicycle lanes, bicycle boxes, bicycle signal heads and others.



BICYCLE PARKING & SPECIAL AMENITIES

In Downtown Cincinnati, bicycle parking accommodations on the street are fairly adequate. The city has mapped over fifty locations which include a combination of formal racks and special street signposts that do double duty as bicycle lock ups.

Having adequate bicycle parking is key to encouraging more bicycle use. Like provision of motor vehicle parking, in the future provision of bicycle parking will be key to business success and employee satisfaction. Also like motor vehicle parking, different types of bike parking are needed to serve different types of bicycle trips. In general, it needs to be convenient and secure. The following list correlates types of bike parking equipment and the needs that various bicycle trips generate.



- Inverted U, or other similar racks, are convenient and secure for short term parking needs. They are excellent for locating in the streetscape in Downtown areas, neighborhood business districts, and similar locations.
- As more cyclists take to the streets, it is important to provide short term parking that is covered, i.e. protected from the weather. This can be done in a variety of ways. Providing bike racks in parking garages Downtown is a good approach to meeting this need.
- Increasingly, cities understand the need for higher security bicycle parking. At transit stations, entertainment venues, major parks and waterfronts, on-demand, high-security bike parking is needed. Bicycle lockers do

not meet this need effectively because they require a key which has to be assigned to the user ahead of time. New technologies are now emerging using “smart cards” or credit cards to control access and new types of mechanical devices to secure the bike.

- High security storage for commuters is important as well. This can be accomplished by providing bike cages in underground parking garages at office buildings or above ground lots that serve individual places of employment.

Other amenities are also important to support regular bicycle commuting. These include a place to shower and change clothes and a place to safely store clothes and gear. In some communities partnerships between businesses and health clubs are being developed in order to make these amenities available to bike commuters. Another approach is to establish multi-service bicycle stations, such as the one Cincinnati is constructing as part of the Riverfront Park. These facilities can offer bike parking for regular commuters, bike rental for tourists, bike repairs, sale of bicycle accessories, short term bike parking, food and drinks, information, internet access and other features.

Bike Sharing Services

Bicycle sharing services are also becoming popular in the U.S. Using new technology, these programs were recently developed in European cities and have been deployed using very large numbers of bicycles (1000's) at locations throughout an urban area. Some bicycle sharing services have been more successful than others. Generally, these types of services are not needed until a community has a critical mass of bicycle transportation demand, or has a unique type of demand that cannot be met by cyclists owning their own bikes, such as a large tourist market. As the University of Cincinnati campus and East Campus medical center continues to grow, this area will become too large for all local trips to be met by walking. A bicycle sharing service may be very effective at reducing the traffic congestion that is created by local vehicle trips occurring throughout the day, such as to go out to lunch, run an errand after work, etc.



OFF-STREET NETWORK

The on-street network is complemented by off-street facilities such as connector paths, shared use paths (multi-use trails), and allowing bicycle use on select sidewalks.

Connector Paths

Off-street connector paths are necessary for making the on-street system continuous, safe and convenient.

Off-street linkages include existing facilities or improvements such as a short segment of path or sidewalk through a city park, a pedestrian/bicycle bridge over a highways or railroad, a public stairway retrofitted with bicycle rolling trays, or a formalized access through a parking lot. In many cases simply adding curb ramps to existing facilities is all that is needed to make these connections accessible for bicyclists.

The connectors identified in the plan are selected for one or more of the following reasons: a) they are necessary for continuity of Network routes, b) they provide links to/from isolated neighborhoods, c) they connect the Network to key destinations, and/or d) they allow passage over, under or around major barriers.

Generally, these improvements are relatively small in nature, and inexpensive. Sometimes they will require simple execution of permits, or installation of curb ramps. The more costly items include:

- a. Retrofit of public stairs with bicycle rolling trays, and
- b. Major rehabilitation or replacement of underpass or overpass infrastructure.



The existing and proposed connectors are shown on Map C. Appendix B provides a list by name and location, facility type, status (existing, proposed new or proposed upgrade), phase designation, and the type of action needed.

Shared-Use Pathway (Multi-Use Trail)

Shared-use pathways provide a high quality walking and bicycling experience in an environment that is separated from traffic. For bicycle transportation purposes, shared-use paths should be a minimum of ten-feet wide and paved. For short distances, their width may be reduced to eight feet if there are physical or right-of-way constraints. These types of paths can be constructed within a roadway corridor, in their own corridor (such as a greenway trail or rail-trail), or be a combination of both. On high speed boulevards, there may be a need for shared-use paths in addition to bike lanes. Shared-use paths should never be used to preclude on-road bicycling, but rather to expand options by providing a higher grade facility for less-experienced cyclists in the same travel corridor.



Shared use paths contribute to bicycle transportation while doing double duty as recreation facilities. Cincinnati's planned network of stream valley and river shoreline trails serve as key routes in the spine system and will allow novice cyclists a less harrowing introduction to bicycle commuting.



Due to its industrial history and ongoing role in the nation's industrial and freight moving economy, Cincinnati has many active railroad lines, and some that are lightly used. While the City has a policy to preserve rail lines for their importance to the economy and for potential future use as rail or bus transit corridors, there may be opportunities for railbanking and development of interim trails to preserve corridors for future transit use. It may be an effective strategy that can provide non-motorized transportation in the near term and bus or rail passenger transit in the long term.

Because many trails may be implemented by park agencies or with recreation as a key goal, the following guidelines suggest how the City should ensure that multi-use trails are designed to also serve transportation uses:

- Provide frequent, bicycle accessible, and well signed access paths that connect to surrounding neighborhoods and cross streets. The main trails as well, should be well signed with distance and destination information.
- Bicycle lanes or *Sharrows* on roadway sections that link two disconnected trail segments, or that extend trails to highly used destinations.
- Expansion of the trails system to eliminate gaps, surmount barriers and extend its reach.
- Building trails to sufficient width (10-15 feet) to ensure safety and comfortable use for bicyclists, runners, pedestrians and other trail users.
- Ensuring high quality design when trails are located adjacent to a major roadway and must be routed across driveways, across slip lanes, and/or through the intersections of cross streets or major interchanges with high speed exit and entrance ramps.

Sidewalks

Generally, sidewalks are not recommended for inclusion in bicycle transportation networks. In Cincinnati, like many other major cities, bicycling on sidewalks is not legal except for children. While sidewalk riding is very lightly enforced today, it is also not a common occurrence.

Due to Cincinnati's generally narrow arterial roads and its many hills, this plan identifies a small role for sidewalk bicycling in very specific situations. It is recommended as a low cost and practical solution to surmount barriers that would be cost-prohibitive to address in any other way. In general these situations include the following:

- Routes where bicycle access is needed but bicycle volumes and pedestrian volumes are expected to be low.
- Right-of-way or traffic safety (high speeds, high volumes, lots of trucks) issues suggest that sidewalk use may be the only option or even the preferred option for most cyclists.
- Long steep hills are unavoidable, street widths are minimal, and cyclists (most of which will be very slow moving) will prefer to be on the sidewalk in these situations. Due to their slow speeds and uphill travel, they will not be a danger to the few pedestrians typically found on these sidewalks.



Sidewalks will be designed to accommodate a) only one-way bicycling on one side of the roadway (uphill direction of travel), or b) one-way bicycling on each side of the road so that bicyclists can safely and easily transition to and from the road at each end of the segment where sidewalk riding is allowed.

Sidewalk bike routes will be designed to avoid the situation where cyclists can easily end up on the street, but traveling against the flow of motor vehicle traffic.

Specific locations where these facilities may prove practical may be on the west side of the city. Sidewalk riding may provide much needed relief from speeding traffic for cyclists slowly making their way up hills such as on portions of Glenway, Queen City, Harrison and Colerain. Another location where sidewalk riding will be a low cost way to traverse a barrier is on Vine Street from Carthage to Hartwell (across the Mill Creek, and Ronald Reagan Highway).

In all of these locations, pedestrian use is very limited and cycling volumes are expected to be modest as well. Cyclists would be required to yield to all pedestrians, and special signs would be posted clarifying legal access and yielding responsibilities. To facilitate sidewalk bicycling in these areas, sidewalks will need to be cleaned and swept and undergo spot repairs. Curb ramps may be needed in select locations. In some situations, sidewalk bicycling can be considered *interim* until other on-street accommodations can be provided.

GETTING FROM PRELIMINARY FACILITY RECOMMENDATIONS TO ON-THE-GROUND IMPROVEMENTS

The next chapter will address plan implementation. For each facility or accommodation described above there are various strategies that can be employed to achieve it, such as restriping roadways after routine resurfacing, narrowing travel lanes or constructing new shared use paths. These implementation *Actions* will be described in greater detail in the next chapter.