






# Spectrum of Non-motorized Routes

The Greenway Collaborative, Inc.

July 27, 2010

<p style="text-align: center;"><b>PRIMARY LINKS</b></p> 	<p style="text-align: center;"><b>NEIGHBORHOOD CONNECTORS</b></p> 	<p style="text-align: center;"><b>OFF-ROAD TRAILS</b></p> 
<b>TYPICAL FACILITY TYPES:</b>		
<p>Complete Streets that may include the following:</p> <ul style="list-style-type: none"> <li>• Bike Lanes &amp; Sidewalks</li> <li>• Sidepaths</li> <li>• Paved Shoulders</li> <li>• Shared-use Arrows</li> <li>• Road Crossing Improvements</li> </ul>	<p>Complete Streets that may include the following:</p> <ul style="list-style-type: none"> <li>• Guided Routes</li> <li>• Named Routes</li> <li>• Bike and Pedestrian Boulevards</li> <li>• Neighborhood Greenways</li> <li>• Crossing Improvements Where Neighborhood Connectors Intersect Primary Roadways</li> </ul>	<ul style="list-style-type: none"> <li>• Foot Trails</li> <li>• Soft-surfaced Trails</li> <li>• Hard-surfaced Trails</li> <li>• Road Crossing Improvements Where Trails Intersect Primary Roadways</li> </ul>
<b>CONTEXT AREAS:</b>		
<ul style="list-style-type: none"> <li>• Urban Suburban and Rural Primary Roads (Arterials and Collectors)</li> <li>• Urban and Suburban typically have bike lanes or shared use arrows paired with sidewalks or sidepaths</li> <li>• Rural typically has paved shoulders</li> </ul>	<ul style="list-style-type: none"> <li>• Urban and Suburban Local and Residential Roads</li> <li>• Connecting Pathways Through Neighborhood Parks and Schools</li> <li>• Provide alternative routes to busy Primary Links</li> </ul>	<ul style="list-style-type: none"> <li>• Major Parks</li> <li>• Waterfronts</li> <li>• Abandoned Rail Corridors</li> <li>• Active Rail Corridors</li> <li>• Transmission Corridors</li> </ul>
<b>PRIMARY TRIP TYPES:</b>		
<ul style="list-style-type: none"> <li>• Daily Transportation to Work and Personal Business</li> </ul>	<ul style="list-style-type: none"> <li>• Mix of Daily Transportation, Safe Routes to School and Close to Home Recreation</li> </ul>	<ul style="list-style-type: none"> <li>• Use Depends on Location</li> <li>• Recreation Destination</li> </ul>
<b>TRIP CHARACTERISTICS:</b>		
<ul style="list-style-type: none"> <li>• Users Typically Segregated Into Mode Specific Facilities Such as Sidewalks and Bike Lanes</li> <li>• Exposure to High Speed and High Volumes of Motorized Vehicle Traffic</li> <li>• Just as Direct a Path of Travel as Using a Motor Vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• More of a Shared Space, Sidewalks May or May Not Be Present</li> <li>• Moderate Exposure to Low Speed and Low Volumes of Motorized Vehicle Traffic</li> <li>• In Some Cases Trips Via Neighborhood Connectors May Be Longer Than the Same Trip Via Complete Streets</li> </ul>	<ul style="list-style-type: none"> <li>• Non-motorized Users Separated from Motorized Vehicle Traffic</li> <li>• Minimal Exposure to Motorized Traffic at Roadway Crossings</li> <li>• Directness of Travel Depends on the Route and What Resources It Connects</li> </ul>



## PAVED SHOULDERS:



- Accommodate bicycle and pedestrian use in rural areas
- Generally do not have bike lane signs and/or pavement markings except at intersections where a designated right turn lane is present, then a paved shoulder should be transitioned to standard bike lane pavement markings to avoid conflicts with right turning vehicles
- May be signed as a bike route or with a Share the Road sign



## BIKE LANES AND SIDEWALKS:



- Bike Lanes are in-road travel lanes designated for bicycle use and delineated with pavement markings and signage
- Bike Lanes direct bicyclists to travel with the flow of traffic and minimize vehicles swerving to avoid a bicyclist
- Bike Lanes provide a safer alternative to sidewalk bicycling for adult bicyclists
- Sidewalks, set back from the roadway and buffered from traffic by trees provide a comfortable walking environment



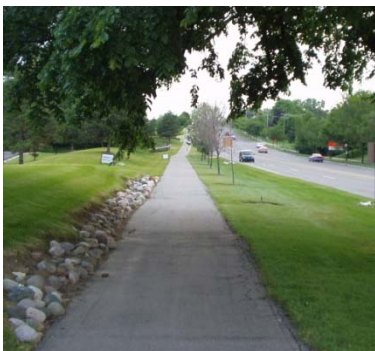
## SHARED-USE ARROWS AND SIDEWALKS:



- Typically used in downtown streets where there is not room for a bike lane, there is on-street parallel parking and bicycles are discouraged from using sidewalks
- Pavement markings direct bicyclists to move with traffic and outside of the reach of opening car doors
- Markings also indicate to motor vehicles to expect bicycles in the roadway
- Used on primary roads with speeds 35 mph or lower



## SIDEPATHS:



- AASHTO Guide for the Development of Bicycle Facilities generally considers sidewalks undesirable as Shared-use Paths
- Should only be used in locations where the pathway is uninterrupted by driveways and roadways for long distances and safe and convenient road crossing opportunities to the other side of the road are provided



Typical Sidewalk Bicycling Conflict



# Neighborhood Connectors

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## GUIDED ROUTES:

GR



At each decision point signs, about the size of a typical street sign, indicate the route direction, destination

- Located primarily on low speed, low traffic volume local roads and connecting pathways
- Signs provide wayfinding by noting direction and distance to key destination such as schools, parks and the downtown
- Identify routes that may not be obvious to someone who is unfamiliar to the area
- Along the route signs are used periodically to reassure users they are still along the route



## NAMED ROUTES:

NR



- Incorporates the elements of the Guided Routes
- Provides trail system branding and specific route identification
- Are helpful in providing consistency where a long-distance route is comprised of a number of different facility types
- Generally used on routes that provide key connections between major destinations – something worthy of a name or number

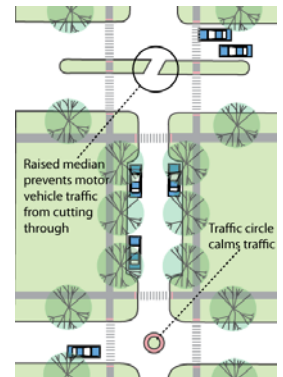


## BICYCLE AND PEDESTRIAN BOULEVARDS:

BPB



- Generally Incorporates the elements in Guided Routes, and Named Routes
- Route is optimized for bicycle travel while discouraging through motor vehicle traffic via tools such as motor vehicle diverter islands that are permeable to bicycles and pedestrians
- Motor vehicle speeds reduced through calming measures
- Stop signs and yield sign are oriented to provide unimpeded flow of bicycle traffic



## NEIGHBORHOOD GREENWAYS:

NG



- Incorporates elements of the Guided Bike Routes, Named Bike Routes, and Bicycle Boulevards
- Designed for pedestrian and bicycle use
- Contains elements that reflect the character of the surrounding community such as natural areas, local art, community gardens and historic features.
- Has sustainable design elements such as rain gardens and permeable pavement





# OFF-ROAD TRAILS

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## FOOT AND SOFT-SURFACE TRAILS:

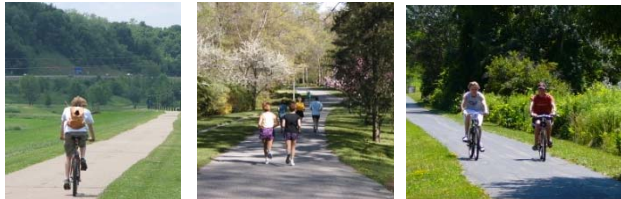
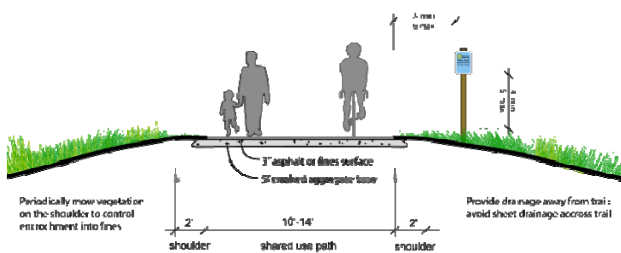
DT



- Surface materials may include native soil, crushed stone and wood chips
- Sometimes considered a “nature trail”
- User groups generally consist of trail runners, walkers, mountain bikers and equestrians
- Generally used for recreational purposes
- May provide key short-cuts

## SHARED USE PATHWAY:

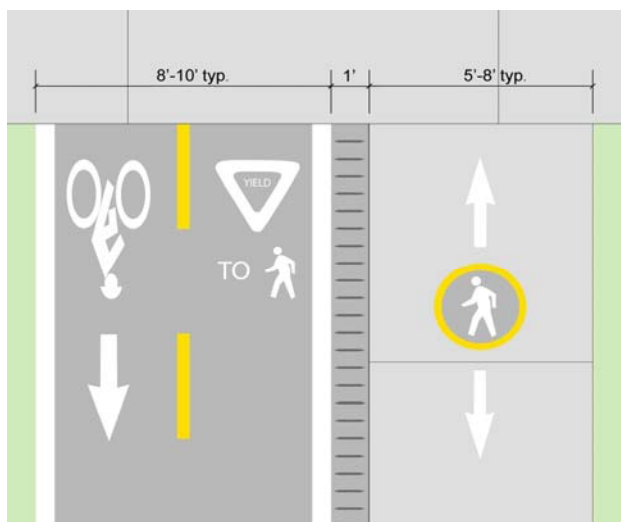
SUP



- The “typical” trail
- Best used in suburban and rural areas with low to moderate bicycle and pedestrian volumes
- Surfacing choice influences user types
- A variety of trail surfaces are used with crushed aggregate fines and asphalt being the most common.
- Minimum width is 10’ with a 2’ buffer on each side
- Generally used for recreational purposes and some transportation trips depending on location

## SEPERATED USE PATHWAY:

SEP



- Trail is comprised of two separate but adjacent trails, one for bicycles and one for pedestrians
- Best used in urban and high use areas
- Minimizes conflicts between bicyclists and pedestrians
- Pedestrians should be accorded right-of-way at the Intersections with walkways
- Typically asphalt is used for the bicycle path and concrete is used for the pedestrian path
- Minimum width is 14’ with a 2’ buffer on each side when combined or they may be constructed as two separate trails separated by a buffer



# Road Crossing Improvements

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## ACTUATED RECTANGULAR RAPID FLASH BEACON:

RFB



- High intensity LED flashers that are paired with crosswalk signs
- LED flashers alternate and get motorist attention when activated
- Push-button or passively activated
- Can be linked to advanced warning signs with LED flashers
- Solar powered models available
- Passive activation works best when there is a long pedestrian approach, such as a pathway

## CROSSING ISLAND:

CI



- Pedestrians only have to cross one direction of traffic at a time
- Provide Storage area for pedestrians waiting for acceptable gaps in the flow of traffic before completing the street crossing
- Can be combined with Actuated Rectangular Rapid Flash Beacons
- Good for locations where there are three or more busy lanes and/or high speed roadways

## HYBRID PEDESTRIAN SIGNAL:

HPS



- Used to help pedestrians cross mid-block where a traditional pedestrian crosswalk signal would be inappropriate
- Minimizes delay to motor vehicle traffic
- Good for locations where there are few usable gaps in traffic, usually on high speed/high volume roadways when a crossing island is not feasible

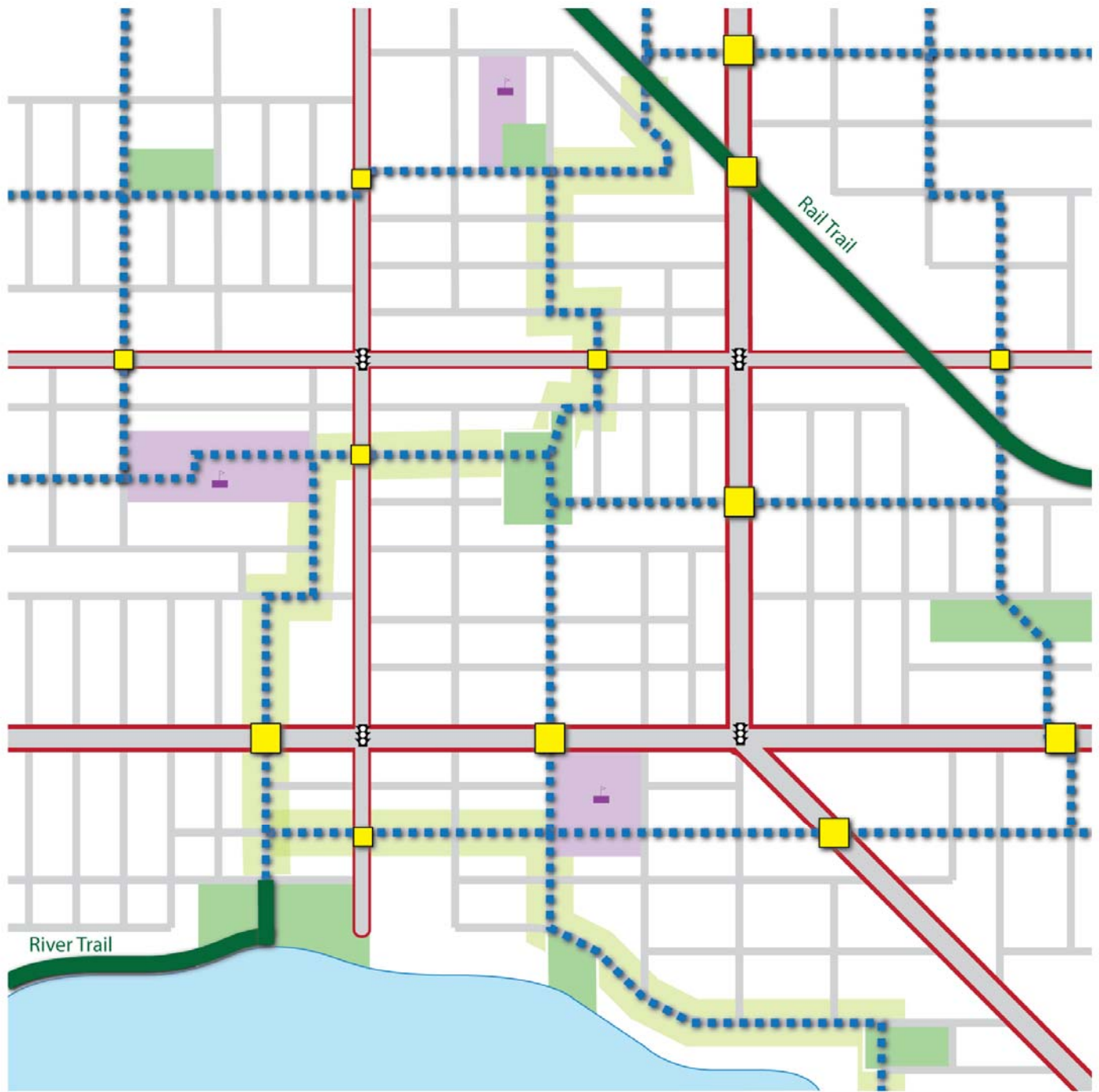
The signal is kept dark at its resting state. When a pedestrian activates the crossing button, a flashing yellow signal is displayed to motorists. This is followed by a steady yellow then a solid red at which time the pedestrian is displayed a walk signal. During the clearance interval, the motorists are displayed an alternating flashing red signal. Motorists may then move forward if the pedestrian or bicyclist has already crossed the road.



# Non-motorized Links - System Map

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The goal is to make every street a "complete street." Typically though, only 40-60% of the primary roads may be easily retrofitted to add bike lanes and sidewalks in the near future. While a significant improvement, this does not provide a comprehensive system that works for all users. A network of neighborhood connectors can usually be implemented at a nominal cost that provides a comfortable route for most users between key destinations.

### Legend:

- |  |                         |  |                        |
|--|-------------------------|--|------------------------|
|  | Signalized Intersection |  | Local Road             |
|  | School                  |  | Primary Road           |
|  | Crossing Improvement    |  | Complete Street        |
|  | Park & Recreation Areas |  | Off-Road Trail         |
|  | School Property         |  | Neighborhood Connector |
|  | Water                   |  | Neighborhood Greenway  |