Central Parkway Bikeway – Love it or hate it?

“Resounding Success” or “Disaster”?

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Central Parkway Bikeway - PRELIMINARIES

**AASHTO Guide**

*Guide for the Development of Bicycle Facilities*
*2012 • Fourth Edition*

**NACTO**
National Assn. of City Transportation Officials,
Central Parkway Bikeway - PRELIMINARIES

Institute of Transportation Engineers Report on Separated Bikeways, March 2014
Central Parkway Bikeway - PRELIMINARIES

Central Parkway Bikeway - PRELIMINARIES

Dutch Design Manual is published by CROW

<table>
<thead>
<tr>
<th>Maximum Motor Vehicle Speed</th>
<th>Motor Vehicle Traffic Volumes</th>
<th>Type of Bike Facility</th>
</tr>
</thead>
</table>
| 19 mph                     | 1,000-5,000 ADT              | • Shared roadway for <2,000 bicycles/day  
|                            | >4,000 ADT                   | • Shared roadway or bike lane for >2,000 bicycles/day  
| 31 mph                     | Irrelevant                   | • Bike lane or separated bikeway  
| 43 mph                     | Irrelevant                   | • Bike lane on roadways with low bicycle volumes (<1,000/day)  
|                            |                              | • Separated bikeway for wider roadways and routes with higher bike volumes (>1,000/day)  

Source: Dutch CROW Manual
Central Parkway Bikeway - PRELIMINARIES

Massachusetts DOT Planning and Design Guide was published last year.

SEPARATED BIKE LANE
PLANNING & DESIGN GUIDE 2015
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
Central Parkway Bikeway - PRELIMINARIES

**Sidepath**
- defined & discussed in AASHTO Guide, two-way path is shared with pedestrians

**Separated Bike Lanes**
- discussed in NACTO Guide, not shared with pedestrians

(Aka Two-Way Cycle Track, Protected Bike Lane)
Central Parkway
Bikeway - PRELIMINARIES

One-Way Separated Bike Lanes
Central Parkway
Bikeway - PRELIMINARIES

Raised Cycle Track
- more common in Europe
- path is at sidewalk level
- separate pedestrian path
Central Parkway Bikeway

“Bikeway” because Cincinnati built several facility types in one project

Signed Bike Route
Bike Lane
Raised Cycle Track
Cycle Track
Green Pavement
Buffered Bike Lane

WYE DESIGN
Central Parkway Bikeway Design

- Started planning meetings July 2012

- Used in-house design team
  - Traffic Signal Engineer
  - Signing/Striping Engineer
  - Planner
  - Project Manager
  - Construction Engineer
  - Graphic Artist
Context

- Creeks, Rivers
- Steep Hillsides
  240 foot climb, Central Pkwy to University of Cincinnati

Street grades up the hill:
- Ludlow 5%
- ML King 9%
- W Clifton 9%
- Marshall 10%
- Ravine 12%
- Straight 13%

Central Parkway Bikeway
Context

- Creeks, Rivers
- Steep Hillsides
- Miami & Erie Canal
  Built 1825-1845

Central Parkway Bikeway
Central Parkway Bikeway

Context

- Creeks, Rivers
- Steep Hillsides
- Railroads
- Central Parkway
- Interstates
- Signed Bike Routes
- Central Parkway Bikeway Phase 1 Project Area
- 2013 Construction
  - Streetcar
  - I-75 Widening
  - Casino

WYE DESIGN
Central Parkway Bikeway

FUNDING APPLICATION

• Assumed two-way cycle track north of Liberty, one-way south of Liberty Street
• Two-way cycle track required modifying six traffic signals, restriping entire roadway
• One-way cycle track added striping in existing 22-foot curb lane

Early design studies

Transition from one-way to two-way
Central Parkway Bikeway

FUNDING APPLICATION
- Green pavement usually used to highlight conflict areas
- Considered using green pavement to guide bicyclists through transitions
- Bid prices (Mar’14) $104/S.Y. for green thermoplastic, $740 for each bicycle symbol

Transition from one-way to two-way
### Central Parkway Bikeway

#### Construction Money

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$625,000</td>
<td>Transportation Alternatives funding application submitted January 2013. Cost estimate was based on preliminary design of two-way cycle track N of Liberty.</td>
</tr>
<tr>
<td>$500,000</td>
<td>Federal funding awarded August 2013</td>
</tr>
<tr>
<td>$556,609</td>
<td>Engineer’s Estimate January 2014</td>
</tr>
<tr>
<td>$425,980</td>
<td>Total Construction Cost</td>
</tr>
</tbody>
</table>

Linear cost

- One-way cycle track $32 per centerline foot (bid) [$170k/mile]
- Raised one-way cycle track $135/ft (change order)
Central Parkway Bikeway

Three types of bikeways were considered:

• 2010 Bike Plan recommended a two-way sidepath on one side of the street – Linn to Marshall

• Cincinnati Park Board said “No loss of greenspace”
Central Parkway Bikeway

Three types of bikeways were considered:

• A two-way cycle track on the west side of the street, Liberty to Marshall. 70% of cyclists surveyed rejected two-way cycle track, favored one-way cycle track.

• Cincinnati chose pylon barrier – more cycle track length for dollars available. Parked cars are part of barrier system.
Central Parkway Bikeway

Three types of bikeways were considered:

• A one-way cycle track on the each side of the street – Elm to Marshall

• Cincinnati needed peak hour restrictions north of Liberty. Sign based on First Ave, Minneapolis.
Central Parkway Bikeway

Raised One-Way Cycle Track

• After bids were opened, one building owner petitioned City Council to preserve full-time on-street parking. A Parkinson’s Clinic had just signed a lease - the only entrance was from Central Parkway.

• Narrowed existing sidewalk and added new bike path — $68,000 for 505 feet.
Central Parkway Bikeway

Raised One-Way Cycle Track at Mohawk-Brighton Building

Design of ramp transition from in-street to raised cycle track is based on the CROW (Dutch) Design Manual.
Three Typical Sections Proposed

PROPOSED TYPICAL SECTION - LOOKING NORTH
50 FOOT PAVEMENT SECTION
BRIGHTON PL TO MARSHALL AVE
CLIFTON COLONY DRIVE TO LUDLOW AVE
TWO ONE-WAY CYCLE TRACKS
Three Typical Sections Proposed

PROPOSED TYPICAL SECTION - LOOKING NORTH
60 FOOT PAVEMENT SECTION
LIBERTY ST TO BRIGHTON PL
TWO ONE-WAY CYCLE TRACKS
Three Typical Sections Proposed

PROPOSED TYPICAL SECTION - LOOKING NORTH
120 FOOT PAVEMENT SECTION
PLUM ST TO LIBERTY AVE
TWO ONE-WAY CYCLE TRACKS AT ON-STREET PARKING

WYE DESIGN
Central Parkway Bikeway

Five bus islands – Elm to Liberty

• Accessible bus loading platform was a concern.

• See Pinellas Trail, St. Petersburg FL for deluxe version.
• Design Exception for Lane width Normally Federal Aid Routes get one 12-ft lane in each direction, 11-ft lanes on remaining. Proposed one 11-ft and rest 10-ft.

• Needed National Highway System exemption for administering as a locally let project.
Central Parkway Bikeway

“Before” crash information

- 157 MV crashes over three years, over 2.24 miles = 4.0 crashes per million vehicle miles (City average = 7)
- Mostly sideswipe and rear end
- About one bike crash per year reported to Police

Speed limit 35 mph
Central Parkway Bikeway

Bike Use Cordon Counts

• Most counts are during weekday rush hours – 7-9 am or 4-6 pm.
• 48 hours of “before” counts - peak hour range from 7 to 15 bph
• 46 hours of “after” counts - peak hour range from 5 to 25 bph
Central Parkway Bikeway

- 74 cyclists
- Busiest bus stops on corridor
- On SB Central Pkwy, RT Only lane, No Left Turn Except Buses, far side bus stop

3-hr Bike Count at 6-legged Intersection – before construction

Central Parkway at Linn/Mohawk
Central Parkway Bikeway

Saturday morning during Findlay Market peak
Central Parkway Bikeway

Central Parkway Bikeway Project included 4 designs:

1. Dash bike lane
2. Weave before intersection
3. Shared right turn lane
4. Restrict turns
5. Thru-Right Arrow
6. Mixing Zone
7. Separate phasing
8. R10-15 Sign
9. Bend-In bike lane
10. Advance Stop Bar

NACTO provides a variety of designs for managing right turn conflicts
Central Parkway Bikeway

Several designs to manage right turns:

1. **Drop lane/barrier**, dashed bike lane at near side bus stop (SB at Liberty) or at heavy right turn.

Law says vehicles should turn from the right most edge of pavement.
Central Parkway Bikeway

Several designs to manage right turns:

1. **Dash bike lane**
2. **Weave before intersection** (NB Central Parkway at Liberty Ave)

- MUTCD is clear about dropping white dashed line when through cyclist moves left. Implies that cyclist yields to RT motorist. NACTO drawings disagrees.
Central Parkway Bikeway

Several designs to manage right turns:
1. Dash bike lane
2. Weave before intersection
3. Shared right turn lane
4. Restrict turns
5. **Continue barrier to the stop bar**, add Thru-Right Arrow (SB Central Parkway at Linn St)

**DOES THE RIGHT TURN ARROW SEND A CLEAR MESSAGE TO BICYCLIST?**
Central Parkway Bikeway

Several designs to manage right turns:
1. Dash bike lane
2. Weave before intersection
3. Shared right turn lane
4. Restrict turns
5. Thru-Right Arrow
6. Mixing Zone
7. Separate phasing
8. **Sign** – Turning Vehicles
   Yield to Bike+Ped

**Sign** – Turning Vehicles
Yield to Bike+Ped

Local variation of R10-15
Central Parkway Bikeway

Northbound Central Parkway at Liberty Ave
Central Parkway Bikeway

One-Way Cycle Track

Central Parkway

Public Education prior to construction

COMING SOON

CENTRAL PARKWAY PROTECTED BIKE LANES

WHAT ARE THEY?

Protected bike lanes have a physical barrier between people riding bicycles and motorized traffic. The barrier could be parked cars, plastic posts, a raised median or planters.

Protected bike lanes help people of all ages and abilities feel more comfortable in the street.

GOOD FOR SAFETY

- Riding on streets with protected bike lanes can reduce cyclists’ risk of injury by up to 89%.
- Bike- and pedestrian-friendly street design leads to less collisions, even when there are more people out.
- Drivers don’t have to worry about unexpected maneuvers by people on bicycles.
- Pedestrians don’t have to worry about bicycles on the sidewalk.

GOOD FOR BUSINESS

- 9th Avenue in New York City saw a 49% increase in business after protected bike lanes were installed (nearby streets only saw +3%).
- Kinzie Street in Chicago saw 55% more bike traffic after a protected bike lane was installed.

A Portland study found that people on bicycles go out of their way to use a street with good bicycle infrastructure. That’s more business exposure.

GOOD FOR LAWFULNESS

- In Chicago, protected bike lanes have resulted in a 161% increase in the number of bicyclists obeying the stoplights.

GOOD FOR EVERYONE

- 71% of Americans have expressed interest in riding a bike more often, but worry that it is unsafe. Lots of people who drive also feel nervous sharing a lane with people on bikes. We believe all Cincinnati should feel safe on our city’s streets—whether they drive, walk or bike.
- Each bike on the street is one less car in traffic, resulting in less pollution, less wear on the road (and therefore less taxpayer-funded maintenance). Bicycles promote active transportation and a healthier community.

Special thanks to transitized.com

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WYE DESIGN
Central Parkway Bikeway

Education
Parking Instructions

PARK NEXT TO BIKE LANE

WYE DESIGN
Central Parkway Bikeway

Education

City of Cincinnati Bike Program
Page Liked · August 6, 2014

Cars: If you're making a right turn adjacent to a bike lane, make sure you look for and yield to bicycles.
Bicycles: If you're about to go straight thru an intersection, make sure you look to your left first for cars that may be planning on turning right across your path. Spread the word!

Like · Comment · Share

Noel Prows and 28 others like this.

39 shares

View 5 more comments

Bob Schwartz: I've had people try to turn right in front of me in intersections that don't have bike lanes.
August 7, 2014 at 8:07am · Like

Kenny Burton: Fellow cyclists, we must watch for automobile traffic. The majority of the drivers do not watch for us. Ride as though you are invisible, but try to be seen.
August 7, 2014 at 11:48am · Like

Crash Avoidance – for both motorists and bicyclists

WYE DESIGN
Central Parkway Bikeway

Striping at beginning of parking lanes helps reinforce safety triangle at intersections
Central Parkway Bikeway

Widened pavement and dropped pylon barrier at school bus loading zone
Central Parkway Bikeway

Measuring Skid Resistance using British Pendulum Machine

Recommendation – if Contractor uses infrared heater, broadcast 20 grit corundum on surface.
Central Parkway Bikeway

Recommendations

• Avoid peak hour parking restrictions! Only two installations in US cycle tracks.

• Cincinnati sign is based on First Ave, Minneapolis

• Minneapolis also installed lighted, overhead changeable message signs downtown

• Cincinnati added pavement marking as retrofit
Central Parkway Bikeway

Testing Pylon Anchors

Recommendation –
• Use manufacturers’ recommended anchor, if available. If not, 3/4”x 3” Tapcon concrete anchors have been recommended.
• Wedge anchors sometimes protrude above the base.
• Revise ODOT QPL for Reboundable Pylons.
Central Parkway Bikeway

Design team couldn’t find an acceptable solution for an unsignalized tee intersection - Central Parkway at Plum.

Looking South
Questions?

How to Prep for Your First Bike Ride
Whether you’re setting out alone or in a group, here’s what to do to guarantee your ride is a success.

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