City of Dublin
OHIO, USA

Best Practices for the Design, Maintenance, and Renovation of Shared-Use Paths

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City of Dublin, Ohio

Agenda

- System Overview & Inventory
- Planning
- Management - Inventory, Inspection, Maintenance, & Work Plans
- Design & Construction

System Overview & Inventory

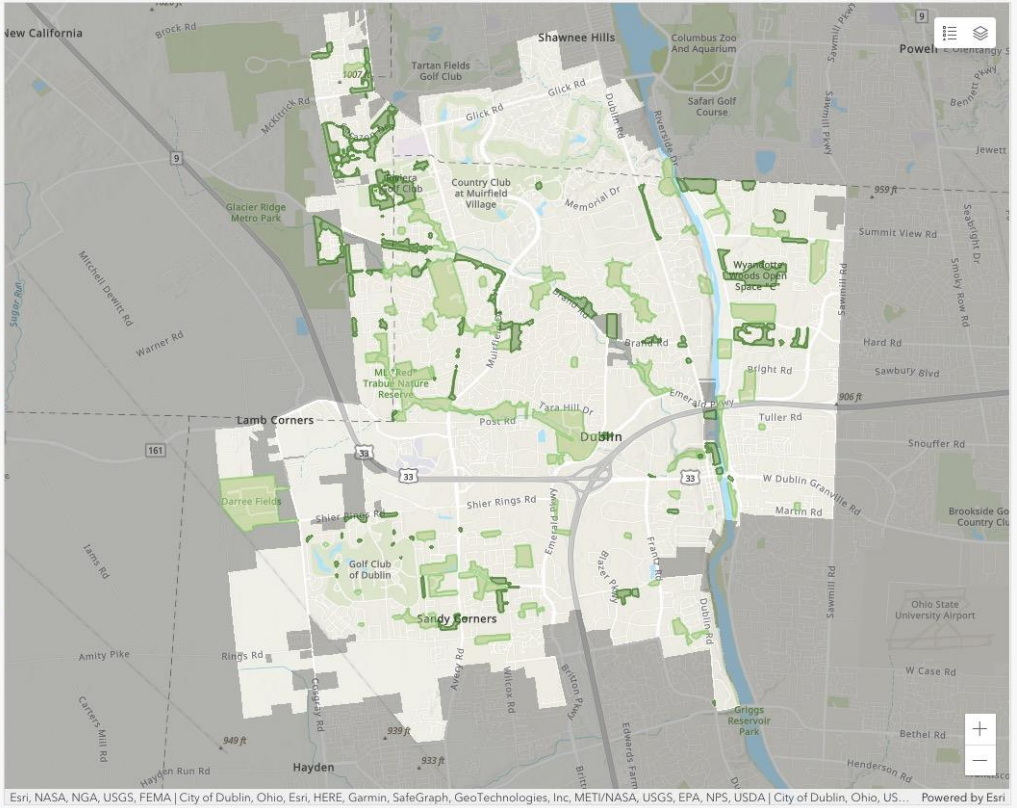
System Overview & Inventory

Total Parks
176

Community Parks
18

Neighborhood Parks
48

Open Space
110



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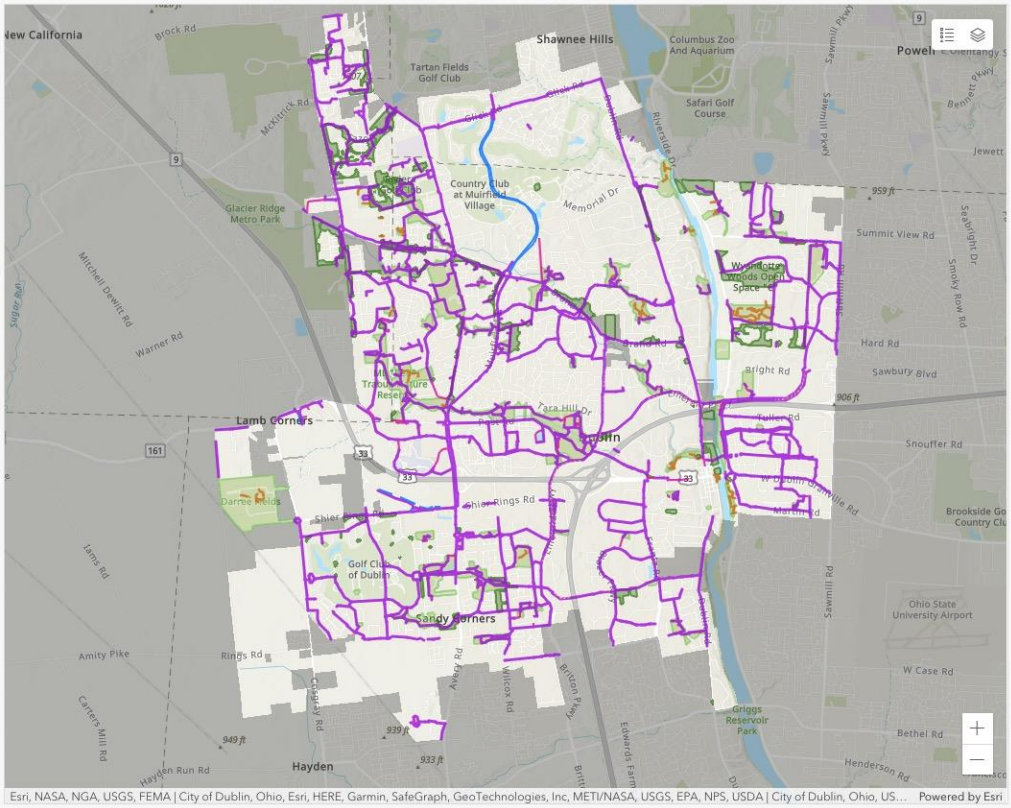


Total SUP
150.8
miles

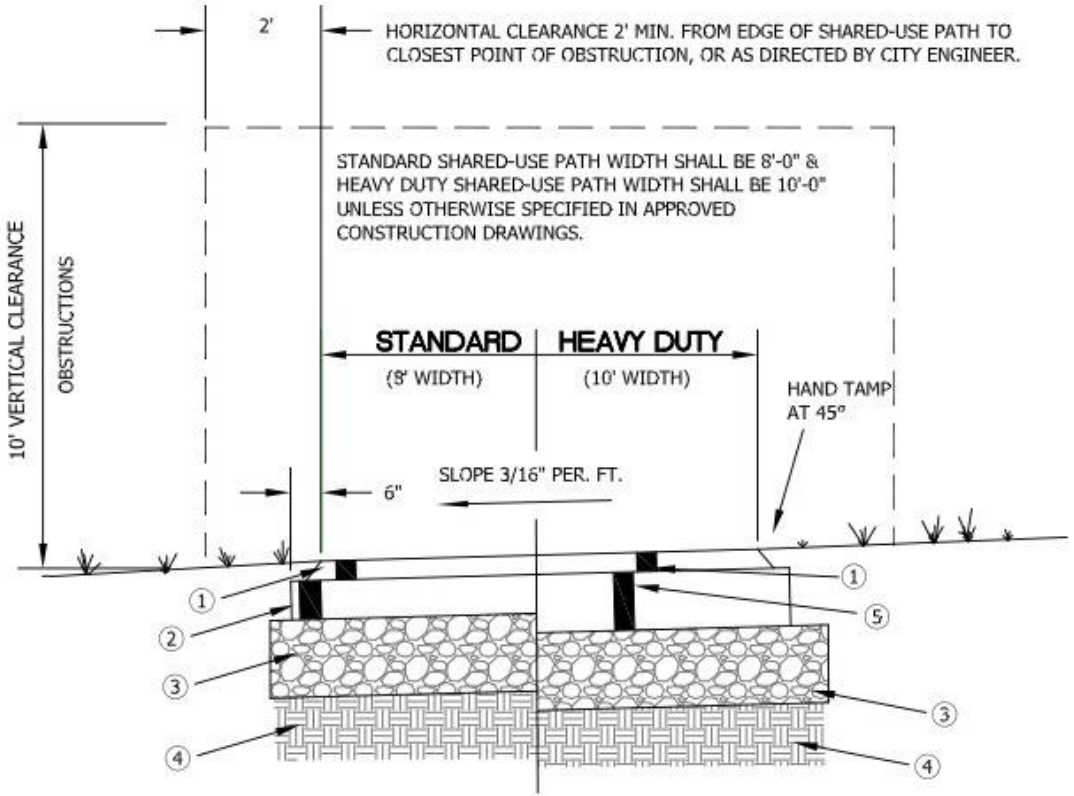
Bike Path
124.9
miles

Connectors & Trails
10.3
miles

Sharrows
10.3
miles

Bike Lane
4.4
miles

System Overview & Inventory



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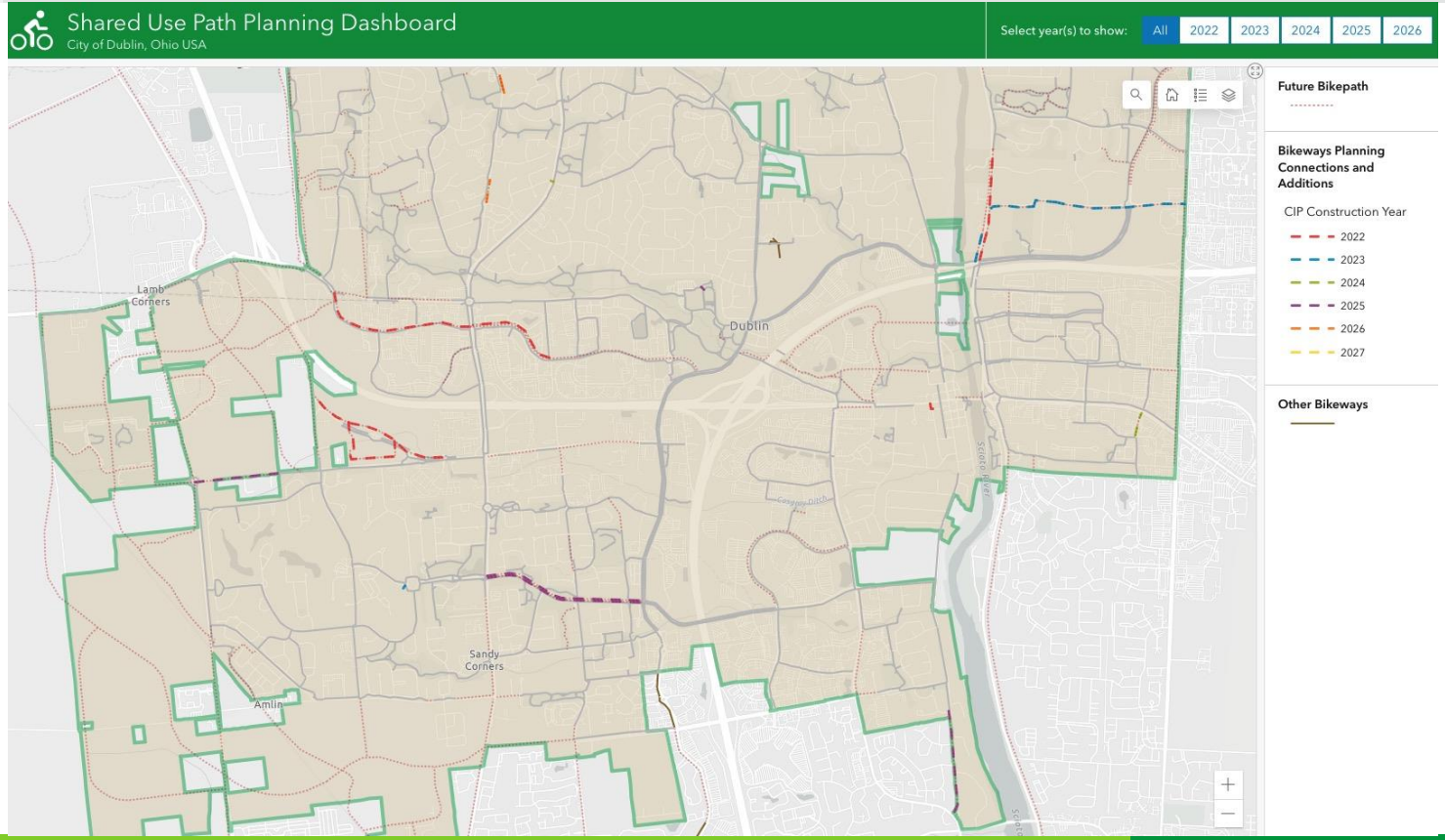
2. 3" ITEM 301, ASPHALT CONCRETE BASE
3. 6" ITEM 304, AGGREGATE BASE
4. ITEM 204, SUBGRADE COMPACTION
5. 4 1/2" ITEM 301, ASPHALT CONCRETE BASE

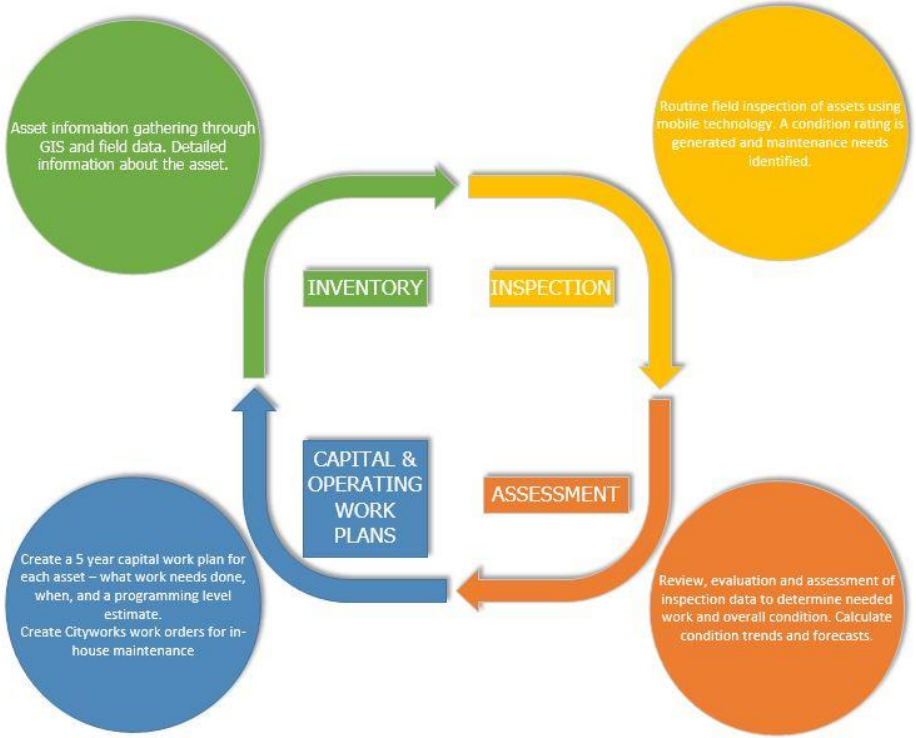

Planning
Management - Inventory, Inspection, Maintenance, & Work Plans

Planning

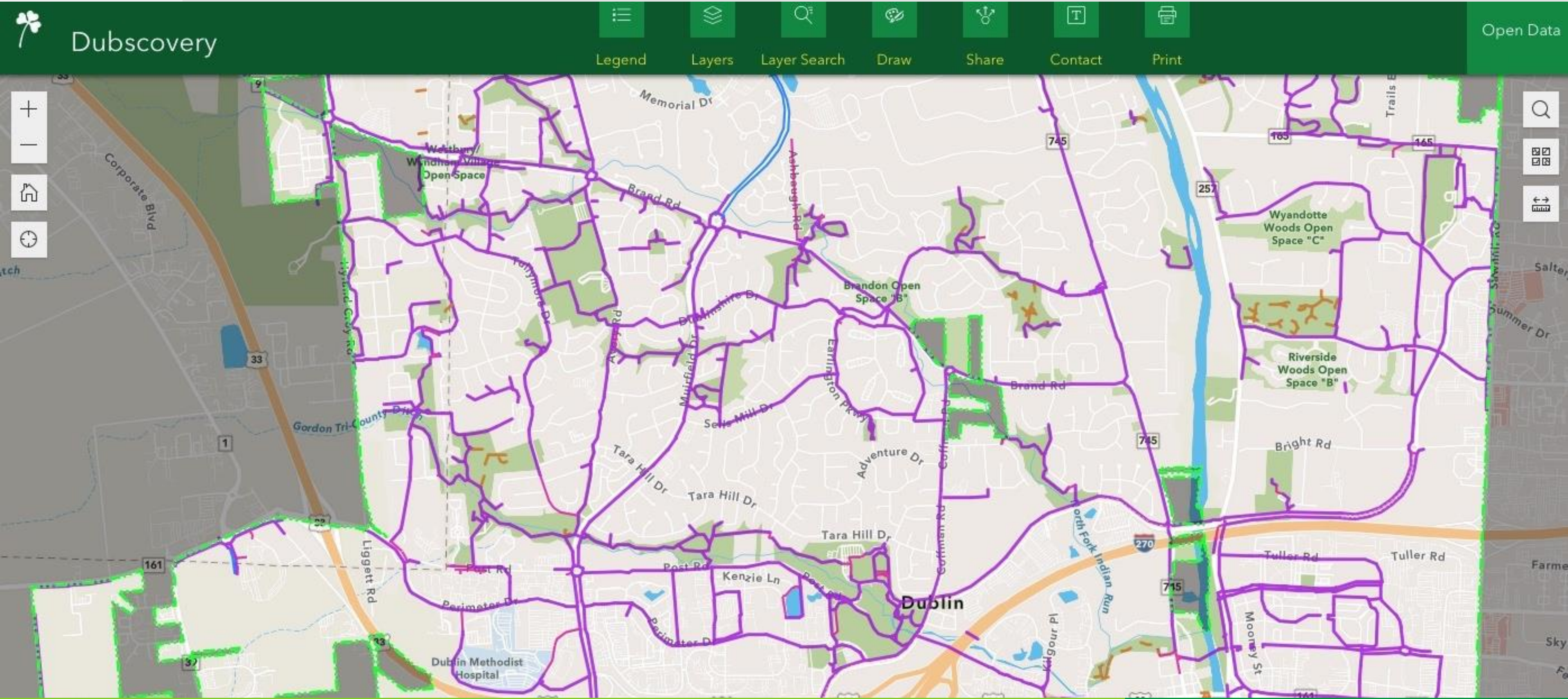

Shared Use Path Planning Dashboard
City of Dublin, Ohio USA
Select year(s) to show:
All
2022
2023
2024
2025
2026
Lamb Corners
Dublin
Sandy Corners
Amlin
Future Bikepath
Bikeways Planning Connections and Additions
CIP Construction Year
2022
2023
2024
2025
2026
2027
Other Bikeways

Bike Path Management

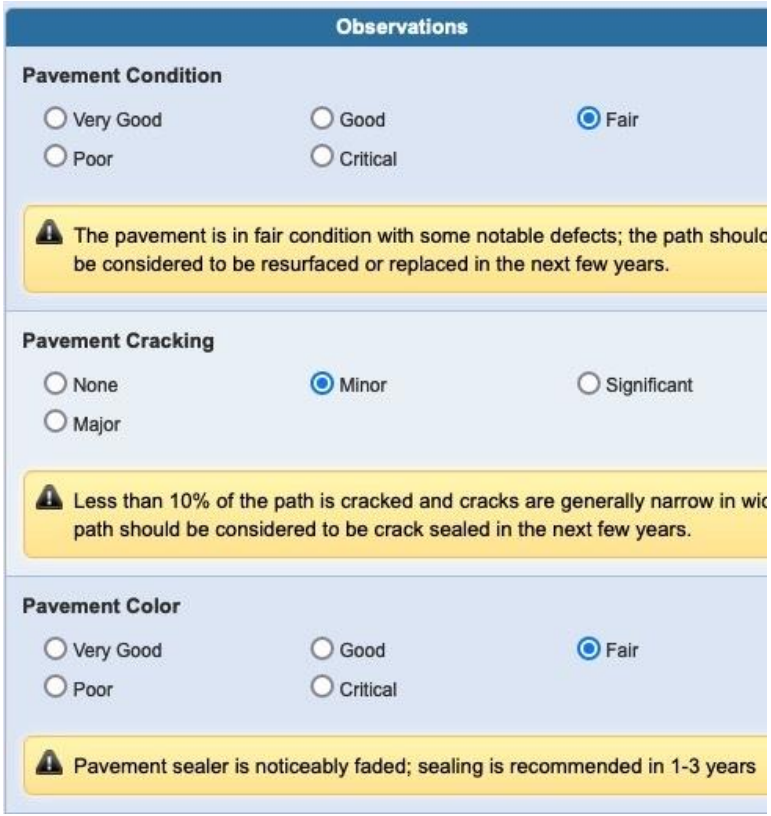
Infrastructure Asset Management Process



Inventory


Dubscovery
Legend
Layers
Layer Search
Draw
Share
Contact
Print
Open Data
Memorial Dr
Corporate Blvd
Brand Rd
Wyandotte Woods Open Space "C"
Brandon Open Space "B"
Riverside Woods Open Space "B"
Bright Rd
Tara Hill Dr
Adventure Dr
Earlington Pkwy
Tuller Rd
Kenzie Ln
Post Rd
Perimeter Dr
Liggett Rd
Kilgour Pl
Dublin
Dublin Methodist Hospital
745
270
165
257
161
33

Inspection



Observations

Pavement Condition

- ○ Very Good
- ○ Good
- ◉ Fair
- ○ Poor
- ○ Critical

⚠ The pavement is in fair condition with some notable defects; the path should be considered to be resurfaced or replaced in the next few years.

Pavement Cracking

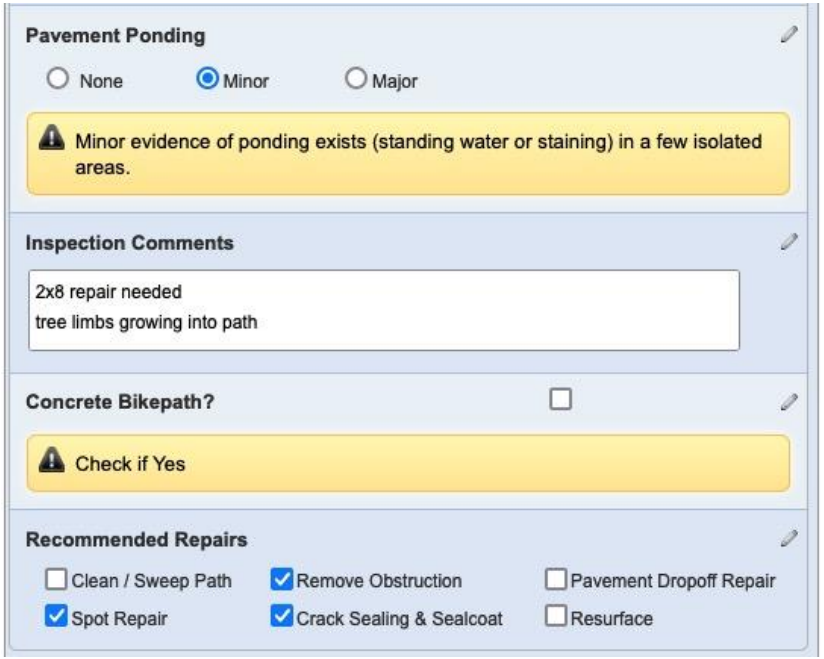
- ○ None
- ◉ Minor
- ○ Significant
- ○ Major

⚠ Less than 10% of the path is cracked and cracks are generally narrow in wi path should be considered to be crack sealed in the next few years.

Pavement Color

- ○ Very Good
- ○ Good
- ◉ Fair
- ○ Poor
- ○ Critical

⚠ Pavement sealer is noticeably faded; sealing is recommended in 1-3 years



Pavement Ponding

- ○ None
- ◉ Minor
- ○ Major

⚠ Minor evidence of ponding exists (standing water or staining) in a few isolated areas.

Inspection Comments

2x8 repair needed
tree limbs growing into path

Concrete Bikepath? ☐

⚠ Check if Yes

Recommended Repairs

- ☐ Clean / Sweep Path
- ☑ Remove Obstruction
- ☐ Pavement Dropoff Repair
- ☑ Spot Repair
- ☑ Crack Sealing & Sealcoat
- ☐ Resurface

Assessment - Maintenance Issues

Fatigue cracking – alligator cracking

Thermal cracking – block cracking, traverse cracking

Longitudinal cracking

Root damage

Rutting

Drainage

Note: A large number of maintenance issues can be traced to drainage issues. Water can reduce subgrade support.

Routine Maintenance – Crack Sealing

Assessment

Bikepath Inspection

Entityuid	Answer	
1	Crack Sealing & Sealcoat	69.00
	Spot Repair	69.00
2	Crack Sealing & Sealcoat	74.00
	Spot Repair	74.00
3	Crack Sealing & Sealcoat	80.00
4	Crack Sealing & Sealcoat	80.00
5	Resurface	66.00
6	Crack Sealing & Sealcoat	66.00
13	Resurface	54.00
14	Resurface	66.00
18	Crack Sealing & Sealcoat	60.00
	Spot Repair	60.00
26	Resurface	49.00
39	Crack Sealing & Sealcoat	80.00
43	Crack Sealing & Sealcoat	80.00
53	Crack Sealing & Sealcoat	74.00
58	Crack Sealing & Sealcoat	60.00
	Spot Repair	60.00
61	Resurface	66.00

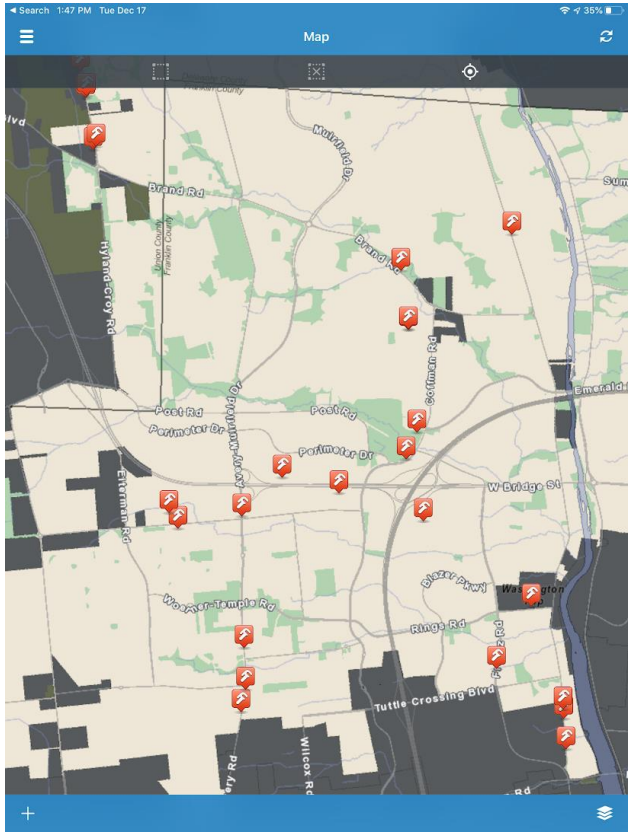
In-House Work:

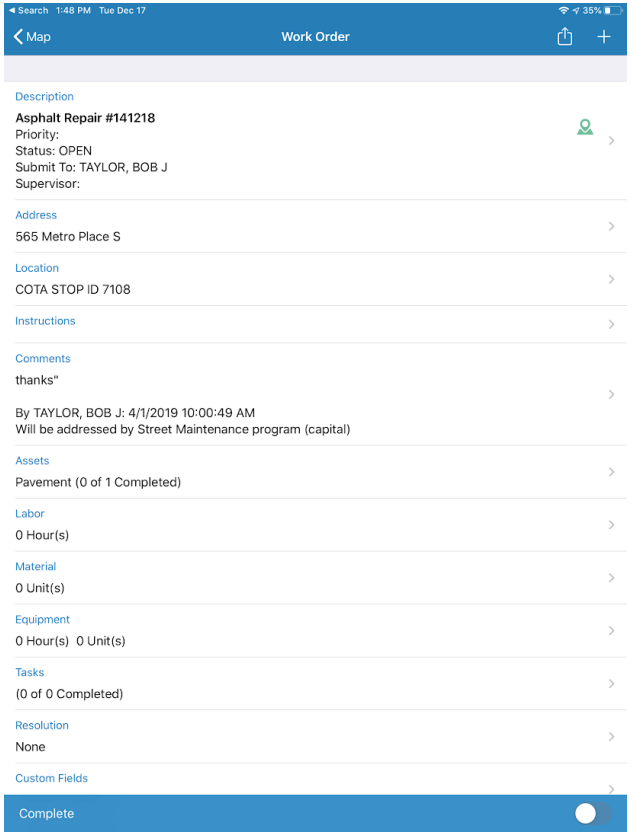
- Spot asphalt repairs
- Vegetation trimming
- Clearing debris from path

Capital Work:

- Crack seal
- Sealcoat
- Large spot repairs
- Resurfacing

In-House Work Orders



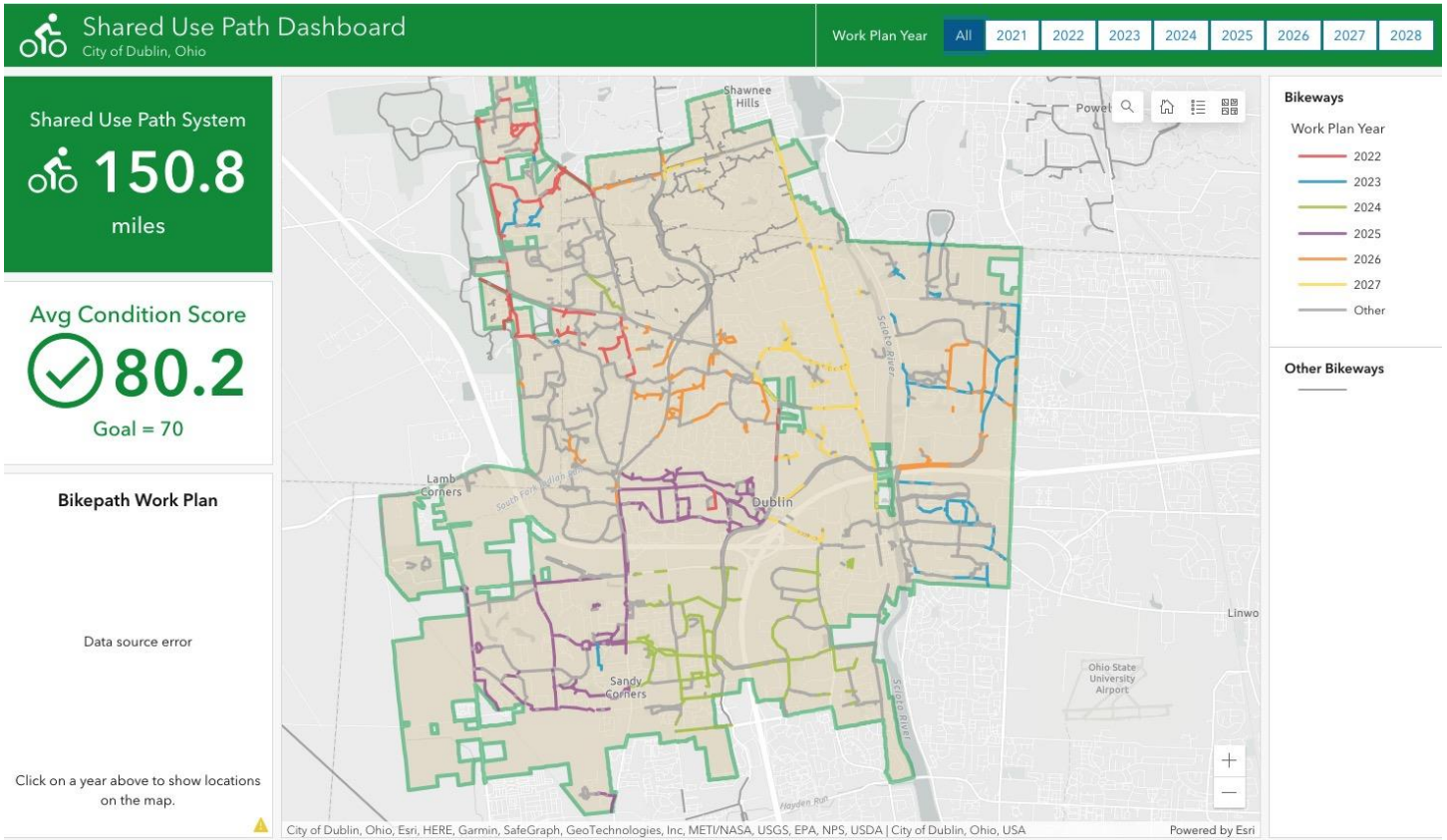


Capital Work Plan

Bikepath Work Plan

2023	Crack Seal & Sealcoat	15,683.4	$32,182.39
	Crack Seal, Sealcoat, & Spot Repair	7,506.5	$18,646.26
	Resurface	8,647.9	$280,192.17
	Spot Repairs	8,083.6	$43,651.67
2024	Crack Seal & Sealcoat	19,979.3	$42,516.04
	Crack Seal, Sealcoat, & Spot Repair	16,613.0	$42,794.97
	Resurface	9,719.2	$326,566.73
	Spot Repairs	6,859.1	$38,411.22
2025	Crack Seal & Sealcoat	22,960.8	$50,169.30
	Crack Seal, Sealcoat, & Spot Repair	10,024.4	$26,514.51
	Resurface	9,677.6	$333,877.25
	Spot Repairs	7,556.9	$43,452.32
2026	Crack Seal & Sealcoat	4,177.6	$9,445.49
	Crack Seal, Sealcoat, & Spot Repair	1,451.3	$3,972.27
	Resurface	136.9	$4,888.35
	Spot Repairs	3,462.1	$20,599.47
2027	Crack Seal & Sealcoat	8,032.7	$18,619.89
	Crack Seal, Sealcoat, & Spot Repair	4,006.3	$11,241.71
	Resurface	7,049.1	$257,996.11
	Spot Repairs	5,015.6	$30,595.18

Capital Work Plan



Design & Construction

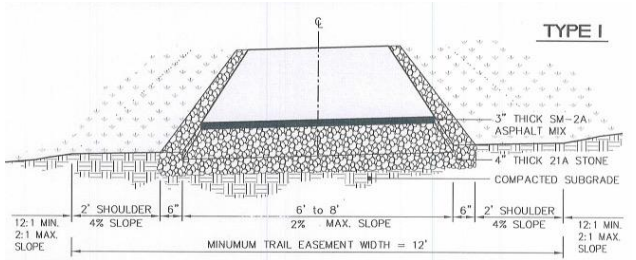
Design Guidelines

- Refer to many design guidelines and aids publish by FHWA, AASHTO, ODOT, and others.
- To determine the best alignment, both horizontal and vertical, become familiar with project area and plans for future paths and development in the area. Walk the alignment. Walk during or shortly after a heavy rain event.
- Addressing storm runoff (drainage) is important for the short- and long-term success of the path.
- Identify the ADA ramp locations and know the existing slopes and vertical profile grade of all driveways crossing the path alignment.
- If feasible, talk with residents. Have at least one public information meeting with the neighborhood.
- Identify and locate above and underground utilities.
- Identify and locate all trees, shrubs, and fences. The health and species of tree may be important in determining the preferred alignment.
- For vertical obstructions adjacent to the path, such as a fence, guardrail, post, or tree, the preferred horizontal offset distance is 4 ft. or more. The minimum horizontal offset distance should be 2 ft.. It may be necessary to have an offset distance of less than 2 ft. clearance for a short distance on the project, we would not recommend less than 1 ft. offset.

Design Guidelines

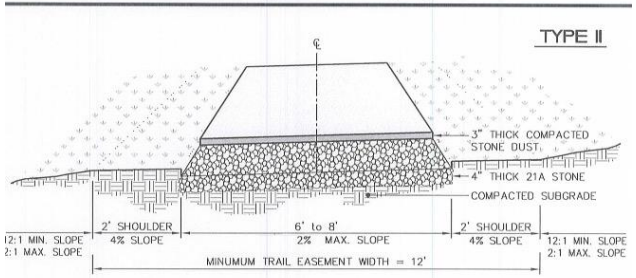
- Trails must be cleared 2 feet beyond the edge of pavement on both sides.
- For a horizontal offset from vehicular traffic on an uncurbed street, we prefer to have a 10 ft. minimum horizontal offset from the edge line to the edge of path.
- For vertical clearance, the preferred vertical distance clear height is 10 ft. The minimum vertical clear height should be 8 ft. and limited to a short distance.
- All vegetative material within a clearing envelope of 10 ft. high by 12 ft. wide should be removed before path construction. Tree branches and tree trunk locations should be verified by the engineer
- During the design of the path - Review the project for constructability. How will the paver and dump trucks access the path

Bikeway/Trail Design – Fairfax, VA



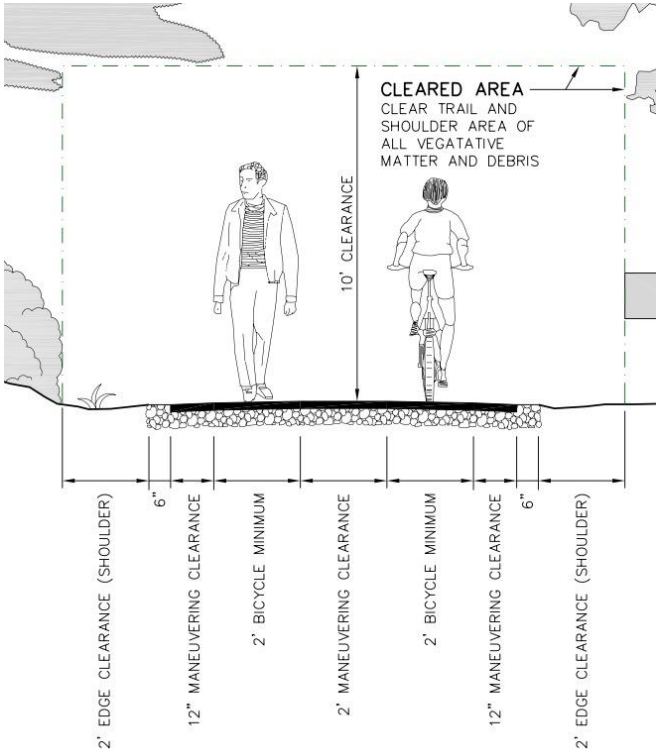
NOTES:

1. Suitable for bicycle and general pedestrian use. 8' is the required minimum width for bikeways and 6' is the required minimum for walkways. Wider sections may be required in heavily traveled areas.
2. Where soil is well drained and compactable, the stone base may be eliminated and this section replaced by a 3 1/2" full-depth asphalt section. Construction of this substitute is subject to approval of the City Engineer.



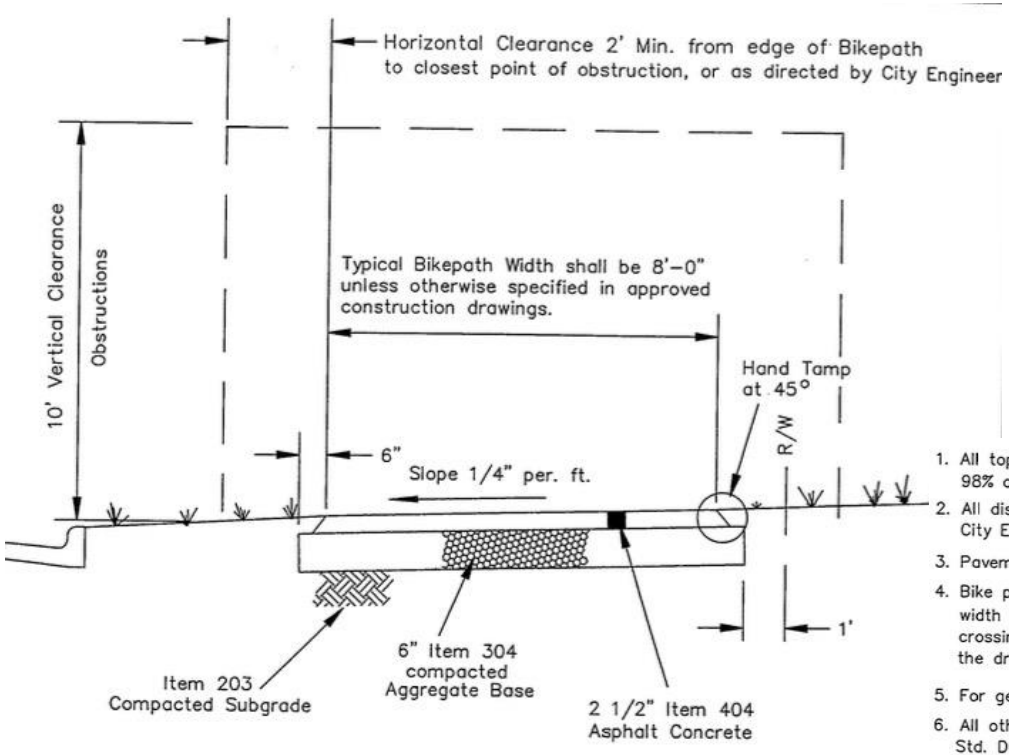
NOTES:

1. Suitable for equestrian use, hiking, and all-terrain (mountain) bicycle use in gently sloped topography. Susceptible to washout and sheet erosion on grades greater than 5%.
2. Depth of stone base may increase due to soil type, stability, and drainage.



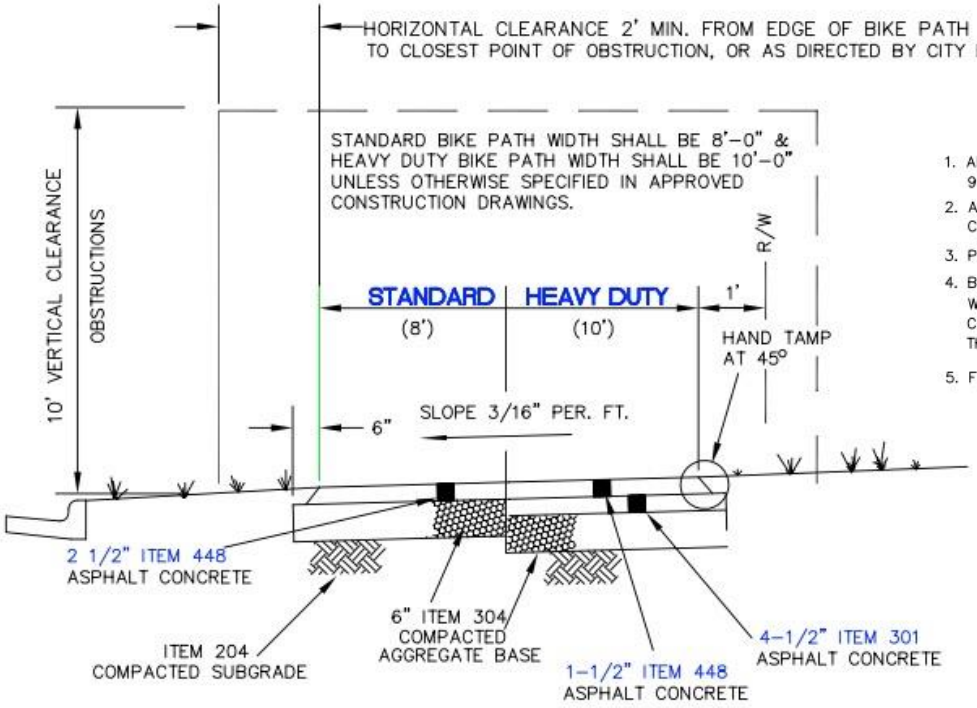
Shoulder is to be firm with no drop off. No substantial slope for 2' minimum.

1997 Typical Pavement Section



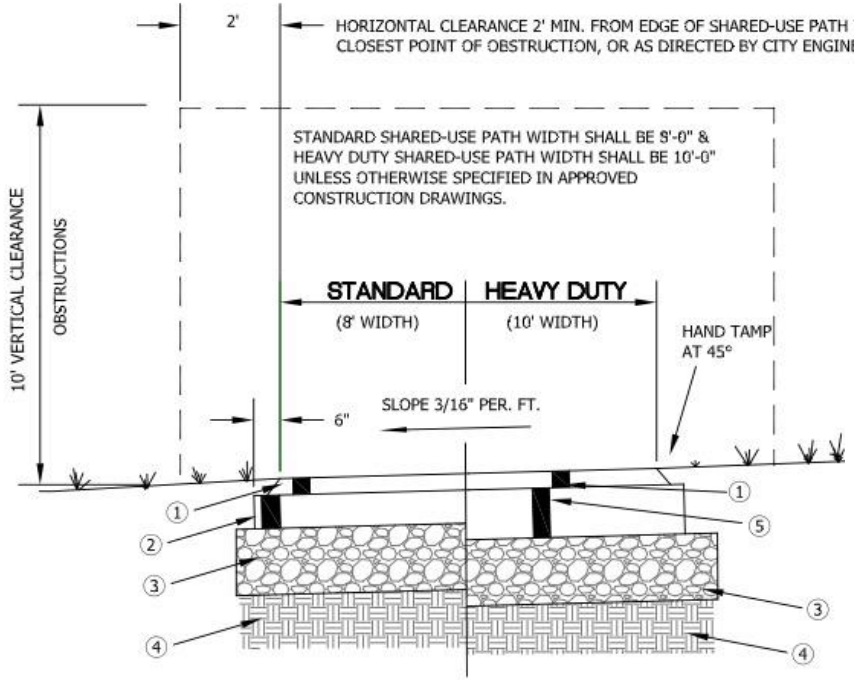
1. All topsoil shall be removed from subgrade areas. Item 203 shall be compacted to no less than 98% of max. dry density. Excess excavated material shall be removed from the site.
2. All disturbed areas shall be seeded and mulched. Seed mixture requires the approval of the City Engineer.
3. Pavement markings and signage shall conform to Ohio Manual on Uniform Traffic Control Devices.
4. Bike paths crossing concrete residential driveway approaches shall be 6" PC Concrete across the width of the driveway approach, unless otherwise approved by the City Engineer. Bike paths crossing non-residential driveway approaches shall match the thickness and cross-section of the driveway approach or 8" PC Concrete, whichever is greater, as approved by the City Engineer.
5. For geometric standards refer to Dublin Std. Dwg. 604.1-96.
6. All other non-geometric bikepath requirements (excluding ramps) shall meet City of Columbus Std. Dwg. 2442 DR. A requirements.

2009 Typical Pavement Section



1. ALL TOPSOIL SHALL BE REMOVED FROM SUB GRADE AREAS. ITEM 204 SHALL BE COMPACTED TO NO LESS THAN 98% OF MAX. DRY DENSITY. EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE.
2. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED. SEED MIXTURE REQUIRES THE APPROVAL OF THE CITY ENGINEER.
3. PAVEMENT MARKINGS AND SIGNAGE SHALL CONFORM TO OHIO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
4. BIKE PATHS CROSSING CONCRETE RESIDENTIAL DRIVEWAY APPROACHES SHALL BE 6" PC CONCRETE ACROSS THE WIDTH OF THE DRIVEWAY APPROACH, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. BIKE PATHS CROSSING NONRESIDENTIAL DRIVEWAY APPROACHES SHALL MATCH THE THICKNESS AND CROSS-SECTION OF THE DRIVEWAY APPROACH OR 8" PC CONCRETE, WHICHEVER IS GREATER, AS APPROVED BY THE CITY ENGINEER.
5. FOR GEOMETRIC STANDARDS FOR CURB RAMP REFER TO DUBLIN STD. DWG. PD-01.

2014 Typical Pavement Section



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4. ITEM 204, SUBGRADE COMPACTION
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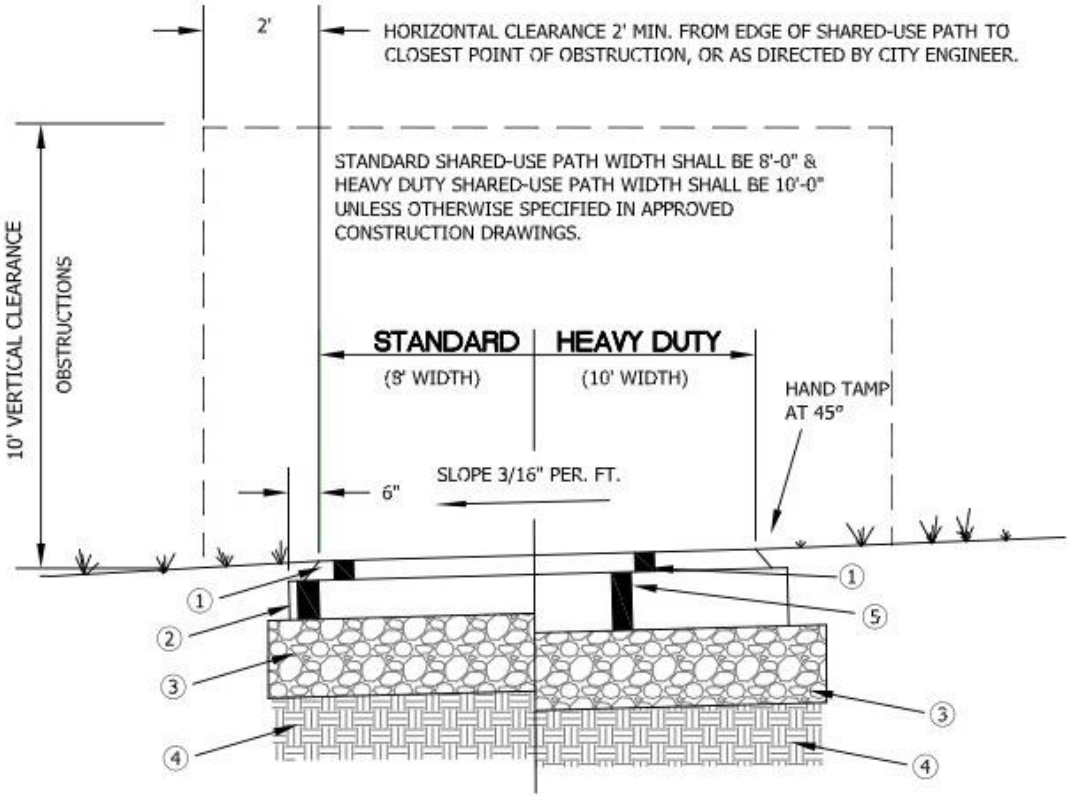
Current Typical Pavement Section Design (2020)



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Pavement Design

Subgrade

Soil Type – existing moisture condition

Most soils in Dublin are glacial till with a CBR of 3. Some areas of Dublin have poorly drained soils.

Subbase

Item 304 – for proper compaction, ensure adequate moisture

Pavement Design

Asphalt Base Course

Item 301 – 3 inches

Asphalt Surface Course

Item 441 (PG 64-22, Item 448) – 1.5 inches

Note: we do not use Item 407 – non-tracking tack coat on the asphalt base course

Fatigue Cracking

Thermal Cracking

Longitudinal Cracking

Root Damage

Rutting

Drainage

Construction Procedures for New Shared-Use Paths

- Provide grading for drainage and storm sewers/culverts to adequately provide for the storm runoff
- Removed topsoil and organics to firm natural soils.
- Proof roll – same as vehicle roadway.
- If soft subgrade encountered, undercut soils. We have used No. 2 stone without filter fabric on many undercuts. Minimum undercut is 6 inches. Choke the No. 2 stone with about 2 inches of Item 304.

Shared-Use Path Renovation

- If existing shared-use path cannot be salvaged, excavate or mill existing path and construct new shared-use path.

- If existing path can be salvaged, use existing surface course and overlay existing shared-use path. Provide grading for drainage and improve storm sewers/culverts as needed.

Constructability - Renovation

Construction

Construction

Construction

Questions

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614.410.4775