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Prepared for:



# Fordham Boulevard Trail Assessment Report





The Fordham Boulevard Trail is in Chapel Hill, North Carolina, along Fordham Boulevard (US 15-501) from Cleland Drive to Ridgefield Road. The trail is approximately 1,700 linear feet and includes one timber boardwalk that crosses Bolin Creek near Estes Drive.

Kimley-Horn performed a site visit to the Fordham Boulevard Trail on January 31, 2018 to document the current condition of the trail and existing boardwalk. Throughout the course of the visit, the weather was clear and sunny. Our objective was to determine design deficiencies that do not meet NC Bicycle Program and AASHTO standards, summarize our findings, and recommend design solutions to bring the trail up to NC Bicycle Program and AASHTO standards. Our field evaluation was performed using visual, non-destructive observations of the trail and boardwalk. Our scope did not include materials testing, hydraulic calculations, or structural calculations. A general description, key findings, and photographs are included in this report to provide the Town with baseline information.

## Trail Assessment

The following section of the report describes the trail based on our limited observation of readily visible elements during the site visit. For additional photographic documentation, see the photo log in Appendix A.

### General Description

- 8-foot asphalt trail with shoulders that vary from 0 to 2 feet.
- Multiple areas of scour along east side of trail due to frequent flooding.
- Cracks in asphalt from tree roots and subgrade failure.
- Two utility poles on edge of trail along southern section.
- Existing chain link fence runs along east side of trail; serves as NCDOT control access fence for Fordham Boulevard.
- Multiple "unofficial" soil side paths that lead to nearby areas (i.e. soccer fields, Fordham Boulevard, and existing gas line easement).
- Large trees on edge of trail along northern section.



Figure 1: Trail looking north from Cleland Drive

### Observed Previous Modifications and Repairs

- It appears that the Town placed rip rap embankment protection on the east side of the trail to help prevent scouring in flood prone areas.

## Key Findings/Recommendations

### General Findings

During the site visit, the trail seemed to be functional for pedestrian traffic even though there are a list of items (see next page) that would need to be implemented for the trail to meet NC Bicycle Program and AASHTO standards.



## Specific Recommendations:

### Shoulders and clear zone conflicts

- To elevate the sharp drop-offs along the trail edges we recommend building 2-foot earth shoulders along both sides of the 8-foot asphalt trail.
- Relocate the two poles closest to Cleland Drive at least 2 feet from edge of trail (one pole is on trail edge and the other is 1.5 feet from trail edge). ADA requires 2-foot clearance from obstacles. At a minimum, we recommend that the Town add warning signs to warn users of obstructions.



Figure 2: Existing Shoulder Edges

### Flooding and Scour Problems



Figure 3: Existing Scour

- To prevent the periodic flooding of the trail, relocate or boardwalk the entire section of trail that is within the flood prone areas. This improvement would be costly for the Town and require additional funding. A more cost-effective approach would be to reinforce the entire flood areas with a mixture of Class 'I' and 'B' rip rap along the eastern side and reconstruct the trail in this flood prone area to reinforced concrete. This improvement would help reduce trail maintenance in this area due to the existing scour on the eastern side of the trail.

### Trail Asphalt Surface

- Multiple cracks in asphalt surface from tree roots and subgrade failure. Tree roots can be pruned at 2 feet from edge of trail and roots removed. Trees and stumps within the 2-foot clear zone (close to Ridgefield Drive) need to be removed. Damaged trail should be patched back in both situations.
- The asphalt trail has settled at both ends of the boardwalk causing a tripping hazard. We recommend patching the asphalt or replacing with reinforced concrete at each end of the boardwalk to create a smooth transition from asphalt trail to timber boardwalk.
- At a minimum, we recommend widening the trail to a 10-foot width at the bollard locations so that there is enough clear zone for cyclists on both sides of the bollard.



Figure 4: Tree Encroachments

## General Recommendations:

- Remove the NCDOT Control Access chain link fence that runs along the east side of the trail. The fence is damaged from flooding and in need of repair. Removing the fence would help eliminate the danger of the downed sections that face the trail, the water/debris blockages it causes when the area floods, and maintenance efforts.
- Multiple "unofficial" soil side paths that lead to nearby areas (i.e. soccer fields, Fordham Blvd, and existing gas line easement) need to be fenced off to prevent erosion in these areas by pedestrians and vehicles. If the Town decides these spurs are needed, we would recommend a concrete spur off the main trail for at least 5 feet to help prevent debris/erosion from entering onto the trail.



- Add trailhead bollards and signage (“Stop” and “No Motor Vehicles”) to all areas where the trail connects with adjacent roads (Cleland Drive, Estes Drive, and Ridgefield Road).
- Add truncated domes to curb ramps per ADA requirements at all roadway crossings (Cleland Drive, Estes Drive, and Ridgefield Road).
- Sweep/blow off the section regularly to remove any debris from flooding.
- Ensure existing lighting is operating properly, is bright enough, and illuminates the existing crosswalk areas at Cleland Drive, Estes Drive, and Ridgefield Road trail crossings. This will improve the safety of those crossings. Town should review crosswalk high-visibility markings and appropriate warning signage for vehicles to be aware of trail crossings.



Figure 5: Crossing and Lighting at Ridgefield Drive

## Boardwalk Assessment

The following section of this report describes the boardwalk based on our limited observation of readily visible elements during the site visit. For additional photographic documentation of the timber boardwalk see the photo log in Appendix A.

### General Description

- Two-span timber boardwalk with an approximate total length of 35'-3" (17'-9" and 17'-6") spanning Bolin Creek.
- Clear width of the boardwalk is approximately 7'-8".
- The superstructure consists of four timber stringers (8"x8") with timber decking (2"x6").
- Timber railings are approximately 4'-6" in height above the deck surface with five side rails and one top rail running along the length of the boardwalk. All longitudinal railing components are 2"x6" timber members and all post are 2"x6" timber members.
- Max openings in the rail are 6 inches.
- End bents are concrete with 1-foot thick wings.
- Interior bent is 8-inch thick concrete wall pier.
- Foundations of the end bents and interior bents are unknown.



Figure 6: Boardwalk

## Design Live Load

- Design live load is unknown. It was beyond the scope of this project to evaluate or approximate the live load carrying capacity of this boardwalk. Concrete bollards on each end of the boardwalk reduce the opening to approximately 5-foot clear. Based on our observation, it is not likely that this boardwalk was designed for H-5 vehicle loading.

## Observed Previous Modifications and Repairs

- Timber railing and deck have been recently replaced.

## Key Findings/Recommendations

### General Findings

During the site visit, no major issues regarding the timber boardwalk were observed. Readily visible elements appeared to be in good condition and performing their intended function.

### Barrier Rails

Barrier rails on each side of the boardwalk have been replaced and meet current AASHTO code and NCDOT Bicycle Facilities Planning and Design Guidelines. No improvement to the railing is necessary.

### Tripping Hazards

The asphalt trail has settled at the both ends of the boardwalk causing a tripping hazard. It is recommended that the asphalt at each end of the boardwalk be patched or replaced with reinforced concrete to create a smooth transition from asphalt trail to timber boardwalk.

### Substructure

Substructure appears to be in good condition. However, no rip rap was observed protecting the 3 substructure elements from scour. It is recommended that the Town monitor the progress of any scour and add rip rap to protect substructure as necessary.



Figure 7: Tripping Hazard



Figure 8: Substructure

Photo Documentation of Path:



Photo 1  
Cleland Drive Looking North



Photo 2  
Asphalt Cracks



Photo 3  
Utility Pole on Path Edge



Photo 4  
Damaged Control of Access Fence with Debris



Photo 5  
Scoured Path Edge



Photo 6  
Unofficial Access to Multi-Use Path



Photo 7  
S. Estes Drive



Photo 8  
Soil Spur to Fordham Blvd.



Photo 9  
Fence 6" from Path Edge



Photo 10  
Trees in Path



Photo 11  
Ridgefield Road Access



Photo 12  
Crosswalk Lighting

Photo Documentation of Bridge:



Photo 13  
General Photo Looking North



Photo 14  
General Photo Looking North



Photo 15  
Concrete Bollard



Photo 16  
Timber Railing



Photo 17  
Timber Decking



Photo 18  
Tripping Hazard North End



Photo 19  
Timber Stringers



Photo 20  
Interior Bent



Photo 21  
South End Bent



Photo 22  
North End Bent



Photo 23  
Tripping Hazard South End