

## Appendix X – Supplemental Design Guidelines

The following supplemental design guidelines are intended to supplement the City of Frederick's Parks & Recreation Master Plan.

### Shared-use Pathways

Shared-use pathways, also known as multi-use trails, are pathways which may be used by bicyclists, pedestrians, wheelchair users, runners, and other non-motorized users. Shared-use pathways design criteria are based on the physical and operating characteristics of bicycles and other path users. Shared use paths must meet or exceed the *Americans with Disabilities Act (ADA)* requirements, and comply with the latest local, state and federal requirements. The *Maryland State Highways Administration (SHA) Bicycle and Pedestrian Guidelines*, as well as the *AASHTO (American Association of State Highway Transportation Officials) Guide for the Development of Bicycle Facilities* should be consulted for information on shared-use path design requirements. Additional guidance includes the *AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities*, *NACTO (National Association of City Transportation Officials) Urban Bikeway Design Guide* and the *US Access Board Public Rights-of-Way Accessibility Guidelines (PROWAG)*.



Figure: Shared-use Pathway

The usable width, horizontal clearance, horizontal alignment, and grade required for a shared-use path are the primary geometric design considerations.

**Surface Materials:** Pathway surface materials should be provided to enable year-round use of the trail corridor and minimize maintenance needs. A hard, all weather, smooth asphalt pavement surface is recommended. At trailheads, waysides, and other amenity areas, alternative paving materials, such as brick/concrete pavers, colored concrete, stamped concrete, unit pavers, pervious concrete or permeable pavers are sensitive coordinated throughout the trail corridor to provide a cohesive network of amenity areas.

**Pathway Width:** The appropriate paved width for a shared-use path is dependent on context, volume and mix of users. The minimum paved width for a two-directional shared-use path is 10 feet. Typically, widths range from 10 to 14-feet, with the wider values applicable to areas with high use and/or a wider variety of user groups, while secondary/minor pathways in park areas may be constructed between 6 and 8 feet. Wider pathways, typically 11 to 14-feet are recommended in locations that are anticipated to serve a high percentage of pedestrians (up to 30 - percent of the total pathway volume) and high user volumes (more than 300 users in the peak hour). Wider paths are advisable in the following situations:

- Where there is significant use by in-line skaters, adult tricycles, or other users that occupy more operating width,
- Where the path is used by larger maintenance vehicles,
- On steep grade to provide additional passing area; or
- Through curves to provide more operating space.

**Grades:** For pathways adjacent to roads, pathway grade should match the grade of the adjacent roadway. Grades on shared-use paths in independent corridors should be kept to a minimum especially on long inclines. Grades greater than 5 percent are undesirable because the ascents are difficult for many path users. Grades on paths in independent rights-of-way should be limited to:

- 5.0 percent maximum for any distance
- 8.3 percent maximum for up to 200 feet
- 10.0 percent maximum for up to 30 feet
- 12.5 percent for up to 10 feet

Additionally, no more than 30 percent of the total path length should have a grade exceeding 8.3 percent. Where grades exceed 5 percent, a resting interval is required at the end of any segment of maximum length as described above.

### Shared-use Pathway Lighting

Lighting provides nighttime visibility along the trail corridor and within amenity areas for trail users. Lighting should be provided between dusk and dawn, and consist of post-top and/or bollard style light fixtures. Light fixtures should be LED and consist of other energy efficient equipment to minimize maintenance and operations costs. Fixtures should be dark sky compliant, tamper resistant, solar (where appropriate), equipped with dimmable/motion sensors, and consistent with the design of other amenities and be scaled for pedestrian users. Fixture shielding or light bar adjustments should be provided on a case-by-case basis to ensure illuminance levels are compatible with adjacent uses.

Typical post-top pole spacing ranges from 40 to 60-feet, with a height of 12 to 16-feet. Bollard spacing is recommended as appropriate in amenity areas or where there are height limitations. Bollard light spacing ranges from 10 to 20-feet with a height of 48 to 52-inches.



Pole spacing and heights should be appropriate for the particular shared-use path location, and their relative proximity to adjacent uses. A lighting analysis should be completed to prioritize the appropriate corridors, path/road intersections, and amenity areas to determine the areas necessitating lighting, as well as the required illumination levels necessary to create a safe and enjoyable user experience.

Potential fixtures to consider include:

Style: Acorn Style  
Brands: (Sternberg/Cooper)



Style: Slim BoxTop Style  
Brands: (Cree/Lithonia)



Style: Bollard Style  
Brands: ANP/Spring City



In general, trail lighting should have cut-offs to shield light from adjacent properties/uses, and comply with local ordinances. Lighting design should comply with *Illuminating Engineering Society of North America (IESNA)* standards, *International Dark Sky Association* (Dark Sky Compliant), the *Roadway Lighting Design Guide* by AASHTO, and the *Maryland State Highway Administration Office of Traffic and Safety, Traffic Control Devices Design Manual – Lighting Design Guidelines*.

## Park and Field Lighting

Over the years, there have been increased demand for park, athletic field and court use, particularly in evening/night-time hours. To meet the increase in demand, lighting is an effective way to extend hours of play during hours of darkness. Identifying areas and the anticipated uses within a park or athletic fields is important when determining the appropriate illuminance levels and fixture types necessary to meet the needs of the community in a safe and effective manner.

Prior to installing lighting within parks, athletic fields and courts, an evaluation of user needs and the ability of lighting to meet the needs of the community should be completed. A lighting prioritization analysis should be completed to determine the areas necessitating lighting, as well as the required illumination levels necessary to create a safe and enjoyable user experience.

Providing a luminous environment throughout the playing area is one of the main goals of lighting for sports through quality and quantity of illumination. All athletic field lighting should comply with the *Illuminating Engineering Society (IES) RP-6-20 or newer*. The IES RP-6-20 provides recommendations to aid in the design of sports lighting systems for most popular sports, including baseball, tennis, basketball, and football, as well as recreational social activities, such as horseshoe pitching and croquet. Additional illumination guidance may be found in *LP-2-20 - Lighting Practice: Designing Quality Lighting for People in Outdoor Environments* and *LP-11-20 - Lighting Practice: Environmental Considerations for Outdoor Lighting* published by the IES.