

Section 1: Overview/Background

1.1 Trail maintenance: Trends, Standards, and Practices

A national push for the construction of new bicycle and pedestrian facilities began in the early 1990s. The results were notable: an 80-fold increase in new construction spending (between 1988 and 2002), the designation through the White House Millennium Initiative of more than 2,000 local, shared-use Millennium Trails, and close to 5,000 state-driven trails projects in progress in 2002.ⁱ In Indiana, this movement has created “more than 3,268 miles of trails and bikeways open for public use across the state,” nearly meeting the goal set by the Indiana Department of Natural Resources of “having a trail within 7.5 miles (or 15 minutes) of all Indiana residents by 2016” in July, 2013.ⁱⁱ

The explosion of multi-use paths brings increased health and recreational opportunities for users, and new planning challenges for trail managers. While the majority of Indiana’s trails have been built with a mix of state and federal funding, the funding options for non-construction activities are comparatively few: in addition to the RTP (Recreational Trails Program), the FHWA lists only the “STP (including the enhancement set-aside), the Highway Safety Improvement Program, and the CMAQ Program (23 U.S.C. 217(a)). State and Community Highway Safety Grant Program funds (Section 402) are to be used exclusively for nonconstruction activities.”ⁱⁱⁱ Additionally, it is far easier to find technical support for design and construction matters than for maintenance concerns. This manual, sponsored by the Indiana Local Technical Assistance Program, is a first response to this deficit of information.

Deferred trail maintenance is a nationwide issue. As our leading expert in parks and preservation services, the National Park Service, approaches its 100-year anniversary in 2016, it faces a multi-billion dollar backlog of deferred maintenance.^{iv} The problem of securing funding for maintenance is not unique to trails: Smart Growth America states that, between 2009 and 2011, annual state spending on expanding and constructing roadways (accounting for 1% of the total state-owned road network) was at \$20.4 billion, while annual state spending on maintenance and preservation (caring for the other 99% of the network) stood at only \$16.5 billion.^v Such spending priorities do not reflect that nearly a quarter (21%) of the national road network was rated in poor condition in 2011.

In 2011, INDOT estimated the cost-per-mile of constructing new separate-alignment, shared-use paths at \$775,000, and the cost-per-mile of building out and maintaining an existing separate-alignment, shared-use path at \$115,000.^{vi}

Table 1. Milwaukee Construction Cost-Per-Mile Estimates

Segment/Trail	Description	Cost-per-mile
Honey Creek Parkway	bike trail from Portland Ave to 70th St, not including bridge construction	\$149,206 per mile for 10 foot wide asphalt trail
Root River	from 60th St. under Hwy 100	\$301,014 per mile for 10 foot

	to Rainbow Airport, not including boardwalk	wide asphalt trail
South Side Trail (a.k.a. Kinnickinnic River Bicycle Trail)	base construction including trail amenities, signage, and drainage issues	\$176,470 per mile for a 10 foot wide asphalt trail
Hank Aaron State Trail (West Allis Line)	6.5 miles, including retrofit of bridges	\$224,307 per mile for a 10 foot wide asphalt trail

Source: Milwaukee County Dept. of Parks, Recreation, and Culture

A comparison of the cost estimates for construction in Milwaukee (Table 1, above) and an assortment of cost estimates for maintenance services (Table 2, below) likewise demonstrate that construction is much more costly than routine maintenance.

Table 2. Assorted Maintenance Cost Estimates

Source	Trail	Cost-per-mile
provided in the Iowa Trails 2000 plan by the Iowa Department of Transportation	a mixture of different surfaces	\$1,500 per mile
Milwaukee County Park System	all asphalt paths	\$2,525 per mile
Rail Trail Maintenance & Operation Manual provided by the Rails-to-Trails Conservancy		\$1,200 per mile (absolute minimum)
for government run trails in the Rail Trail Maintenance & Operation Manual provided by the Rails-to-Trails Conservancy		\$2,077 per mile
in the Trail Cost Model - Draft by the Wisconsin Department of Natural Resources	unpaved trail	\$2,042.06 per mile

Source: Milwaukee County Dept. of Parks, Recreation, and Culture

Despite the difficulties with comparing collected cost data, which is compiled by different agencies on varying criteria, it is clear that initial construction costs dwarf the costs of routine maintenance and enhancement of existing facilities; however, as this manual will stress, deferring maintenance can dramatically increase maintenance costs and invert that cost balance. Unfortunately, deferment is common since funding for routine maintenance has been comparatively difficult to secure. As trails age without appropriate maintenance, opportunities for substantial cost-savings through early intervention shrink. Despite a present lack of funding and technical support, local trail managers are obligated to maintain federally-funded trailways in accordance with standards for public safety and access rights (see [Table 1](#)). In addition to compiling a menu of best practices for managers' reference, this document highlights the important role of maintenance to the longevity of trail systems and the need for legislation establishing appropriate funding mechanisms.

Table 3. National, state, and industry standards

Indiana Department of Transportation – 2013 Design Manual. Chapter 51 – Special	http://www.in.gov/indot/design_manual/files/Ch51_2013.pdf
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Design Elements.	
ADA.gov. Information and Technical Assistance on the Americans with Disabilities Act	http://www.ada.gov/ada_req_ta.htm
The American Association of State Highway and Transportation Officials. Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2010 (AASHTO Pedestrian Guide)	http://www.railstotrails.org/resources/documents/ourWork/trailBuilding/DraftBikeGuideFeb2010.pdf
The American Association of State Highway and Transportation Officials. Guide for the Development of Bicycle Facilities, 1999 (AASHTO Bike Guide)	http://www.fhwa.dot.gov/environment/recreational_trails/guidance/manuals.cfm#aashto
Federal Highway Administration. Program Guidance.	http://www.fhwa.dot.gov/environment/recreational_trails/guidance/manuals.cfm#links
Federal Highway Administration. A Guide for Maintaining Pedestrian Facilities for Enhanced Safety.	http://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa13037/

1.2 The Ohio River Greenway: History

The Ohio River Greenway is a paved, multi-use, urban, linear recreational trail in Southern Indiana that roughly follows the course of the Ohio River. When it is completed in 2015, the 7-mile trail will pass through the Southern Indiana cities of Jeffersonville and New Albany and the town of Clarksville, and, with the 2014 opening of the Big4 Pedestrian Bridge, spans the Ohio River to link to Jeffersonville to Louisville, Ky.

Figure 1. Map of the Ohio River Greenway.



Source: Ohio River Greenway

The purpose of the Greenway is to increase connectivity between the three riparian localities, between their residents and the natural resources and services provided by the Ohio River, and between the cities on either side of the Ohio River. The design of the Ohio River Greenway provides recreational opportunities, a contiguous alternative transportation option between municipalities, natural resource protection, opportunities for cultural and educational learning, a local economy stimulus, and health and wellness activities.

Governance of the Greenway is complicated, as the trail falls within three local governmental jurisdictions – the cities of New Albany and Jeffersonville, and the town of Clarksville – which, in turn, are within the boundaries of Floyd and Clark counties. Additionally, the Greenway intersects with lands that belongs to a state (Falls of the Ohio State Park), and lands that are managed by the U.S. Army Corps of Engineers, a federal agency. Each of these entities observes a distinct set of rules related to funding sources and management procedures, which were partially spelled out in the June 2003 Project Cooperation Agreement between the Department of the Army (Corps of Engineers) and the non-Federal sponsors (Ohio River Greenway Development Commission, City of New Albany, Town of Clarksville, and the City of Jeffersonville).

The Ohio River Greenway Commission was created in 1993 to facilitate the collaborative governance of the Greenway, and to serve as a non-profit, quasi-governmental channel for funding and other resources. The genesis of the Ohio River Greenway Commission was a charter by the Indiana Legislature in April, 1993, which created the Ohio River Greenway Development Commission and granted it the power to coordinate, recommend, and implement Ohio River Greenway activities. The Commission is comprised of three persons from each of the three local governments –the Chief Executive (Mayor or Town Council President) of each locality and that Chief Executive’s two citizen appointees – and representatives from Clark and Floyd Counties who are appointed by the Governor for four year terms. Non-voting members that lend support to the Commission include the Director of the Office of Tourism, the Director of the Indiana Department of Natural Resources, the Commissioner of the Indiana Department of Transportation, and the President of the Indiana Economic Development Corporation. Appointed and non-voting members of the Commission are volunteers (Ohio River Greenway Commission, 2014). The present organization and membership of the ORGC, including its standing committees, are shown in [Appendix A](#).

In 2007, the Commission added an employee, a project manager, and in 2013, it hired a part-time administrative assistant. Also in 2013, realizing the pressing need for maintenance policy and manual to coordinate maintenance of the completed portions of the greenway, the Commission applied for and was awarded a grant through the Indiana Local Technical Assistance Program (LTAP) to research and develop a trailway maintenance manual.

1.3 Ohio River Greenway: Current Maintenance Practices & Anticipated Needs

The first step to creating a maintenance program is to understand current and anticipated needs and assess the local capacity to meet them. Currently, maintenance of the Ohio River Greenway is handled by various departments within each of the three communities. [Table 4](#) summarizes the current approach to maintenance. This information was gathered through interviews with officials from the three Ohio River Greenway communities.

Table 4. Current Practices

	Clarksville Parks & Recreation	New Albany Flood Control District	Jeffersonville Parks and Recreation	Jeffersonville Redevelopment
Mowing	Y	Y	Y (Contract out)	
Edging	Y	Y	Y (Contract out)	
Landscaping	Y	Y	Y (Contract out)	
Trash/Debris Removal	Y	Y	Y	
Graffiti Removal	Y	Y	Y	
Signage	N	Y		Y

Gate & Fencing	--	Y		Y
Lighting	Y (Contract out)	Y		Y
Drainage & Riprap Areas	Not Yet	Y	N	N
Benches	Y	Y		Y
Picnic Tables	Y	Y		Y
Garbage Cans	Y	Y	Y	Y
Play Structures	--	Y	--	--
Flagpoles	Y	Y		Y
Docks	--	Y		Y
Seasonal Care (i.e. snow removal, flooding, etc.)	N	Y	N	N
Other				

The interviews revealed common concerns. For example, none of the communities currently uses a mobile application to capture trail user concerns, although there is expressed interest in doing so in the future. Many robust models exist currently: one well-designed example is the Louisville Mobile “suite” of apps, created by Ohio River neighbor Louisville, KY, which includes user feedback options for the 100-mile Louisville Loop multi-use path.^{vii} Additionally, all three communities anticipate a range of repairs to the asphalt and concrete trailways and bridge decks in the near future, and are concerned with associated costs.

Taking or updating an inventory of fixed assets is another important step in managing maintenance planning. The Ohio River Greenway inventory was created using [GISCloud](#), a mapping software, to list and map its fixed assets. The major challenge in creating an inventory is to define its scope: determining the relevant distance from the trailway edge, whether to count trees and other natural features, whether and how to note the presence of above or below ground fiber optic and power lines, what trail uses are allowed, and so on. If the trail is in an urban setting, it might be useful to inventory trail crossings, noting elements such as crossing width and type, signage and pedestrian signals, and ADA accessibility for the ramp and grade.^{viii} There are numerous, customizable inventory templates available online, and the Ohio River Greenway inventory template is included in [Appendix C](#).

ⁱ [Center for Environmental Excellence, p. 48](#)

ⁱⁱ [INDOT, Bicycle and Pedestrian Program](#)

ⁱⁱⁱ [INDOT, Bicycle and Pedestrian Program; FHWA, Bicycle & Pedestrian Program](#)

^{iv} [Clementino, Deferred Maintenance](#)

^v [Smart Growth America, Repair Priorities 2014](#)

^{vi} [INDOT, Indiana Safe Routes to School Program](#). This is no longer a standalone program, so these figures could not be investigated; however, these are the most recently available figures available from the state, and are thus included herein.

^{vii} [Net Tango, Louisville Mobile](#)

^{viii} 11/07/2014, Personal email communication with Amy Hartzog and Dawn Ritchie.