



5. STATEWIDE NETWORK RECOMMENDATIONS



The role of statewide networks

The Complete Streets Policy, discussed in Chapter 6, will have a major impact on improving Iowa's state highways for bicycling and walking. Eventually, the incremental improvements made by following the Complete Streets Policy will mean that Iowa's network for bicycling and walking will provide a higher level of mobility. However, there is still a significant need to plan specific bicycle and pedestrian networks for a variety of reasons, such as to account for situations not covered by the Complete Streets Policy (e.g., county roads), plan a statewide network of multi-use trails, and facilitate the implementation of Iowa's portion of multiple national trails and US Bicycle Routes.

5.1 A new approach to statewide network planning

All types of bikeways and trails (state, regional, and local) are important for the mobility of bicyclists and pedestrians in Iowa. Just as Interstate highways and city streets serve different purposes yet are equally important, so are the various types of bikeway and trail networks. In the past, the trails in Iowa were designated as Level 1 (Trails of Statewide Significance), Level 2 (Trails of Regional Significance), and Level 3 (Trails of Local Significance).

However, this implied a prioritization of statewide trails over regional and local trails. Beginning with this plan, the Iowa DOT is discontinuing the numbered classification system and simply referring to trails as either part of the statewide trail network (which includes regional trails) or local trails that are part of a local trail network.

“Trail” versus “route”

The term “trail” is often used to denote several different things, such as a nature trail a paved pathway, or an interstate on-road bike route. In this plan, the phrase “**multi-use trail**” refers to a paved or smooth gravel pathway for walking and bicycling that is separated from motor vehicle traffic yet still functions as a transportation facility.

The phrases “**national trail**” and “**route**” are used to denote interstate bicycle and pedestrian routes that are often referred to as “trails,” such as the Mississippi River Trail, which predominately utilizes paved shoulders or shared roadways.

There is, of course, some overlap. The American Discovery Trail *route* follows many miles of paved separated *multi-use trails* (as well as on-road bikeways).

This Plan identifies two types of statewide networks for bicycle and pedestrian mobility:

1. A statewide network of multi-use trails

The Statewide Trails Vision largely mirrors past statewide trails network vision plans and returns to a pure multi-use trail focus. For the purposes of allocating state and federal funding, the Iowa DOT will prioritize trails that make significant contributions to improving state and regional connectivity, but local trails may still be eligible under new prioritization criteria. There are similarities to the state's roadway network, in which the Iowa DOT plans, designs, and funds state highways. Counties do the same for Farm-to-Market roads and municipalities are responsible for local streets. However, for multi-use trails, the Iowa DOT has a modest coordination role, but at the same time a much smaller role with regard to designing and maintaining multi-use trails. It will continue to be the responsibility of cities, counties, volunteer groups, the Department of Natural Resources, and other partners to maintain multi-use trails.

The statewide trails vision network, discussed on the following pages, has been planned based on historical corridors (such as railroad alignments) and decades of planning and development. However, refinements and even larger modifications can be proposed and made by MPOs and RPAs so long as connectivity is not greatly altered. This new approach to statewide trail planning indicates regional and statewide priority for multi-use trails to guide local, regional, and statewide investment, encourage linkages, preserve corridors, and indicate needs related to road projects (e.g., including provisions for future trail crossings when reconstructing a road).

2. A statewide network of national trails and US Bicycle Routes.

This network is composed of three former Level 1 trails (the American Discovery Trail, the Mississippi River Trail, and the Lewis and Clark Trail) as well as several US Bicycle Routes. While portions of this network will be in the form of multi-use trails (at least 75 percent of the American Discovery Trail will be multi-use trail, much of which will overlap the statewide multi-use trail network), it will largely be composed of on-road bikeway facilities (mostly low-traffic rural roads).

The purpose of this network element is to coordinate with national plans for interstate routes, encourage bicycle tourism, and improve intercity connectivity. This plan will help to identify road segments on which accommodations are needed, such as wider paved shoulders or multi-use trails, and segments that are not part of the state highway system (such as county roads) and are therefore not affected in the same way as state highways by the Complete Streets Policy.



Other network considerations

Whether for recreation or transportation purposes, most bicycle and pedestrian trips cover short distances. Avid bicyclists will often ride 100 or more miles in one trip, but for the majority of the bicycling and walking population, trips are often a few miles or less. This is especially true for utilitarian walking and bicycling trips, which represent the majority of transportation-related non-motorized trips. Therefore, the continued development and improvement of local and metro area bicycle and pedestrian networks is very important in terms of providing transportation choices and shifting trips from motor vehicles to walking and bicycling.

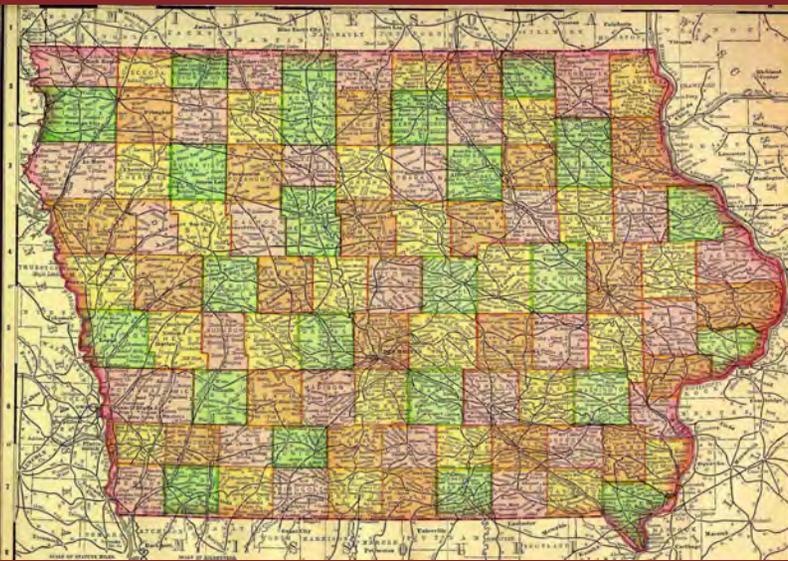
Local and metro area bicycle and pedestrian networks primarily exist within cities and metro areas. The strategies for developing these networks therefore differ from those used in the development of rural networks. For example, while it is preferable to avoid high-traffic rural roads, it is important to provide bicycle and pedestrian accommodations along high-traffic city streets (which are often state highways) because these are the streets along which the majority of destinations are located. In other words, if local bicycle networks primarily follow low-traffic side streets, access to destinations will be severely limited. The types of accommodations and treatments provided are also more numerous and context-sensitive—traditional bicycle lanes, bicycle lanes with physical separation from motor vehicles, cycle tracks, shared lanes, multi-use paths, bicycle boulevards, unique pavement markings, specialized traffic signals, etc.

The implementation of effective local and metro area networks is therefore arguably more challenging than for rural networks. There are many more agencies and stakeholders involved—including the Iowa DOT—so partnerships between organizations and knowledge-sharing is crucial. As such, the Iowa DOT will strive to foster such partnerships, encourage municipal and regional Complete Streets policies, provide technical assistance through design guidelines, and promote the development and implementation of comprehensive bicycle and pedestrian transportation plans.

5.2 Statewide Trails Vision

The State of Iowa has envisioned a statewide multi-use trail network for more than 40 years, dating back to the bicycling renaissance of the 1970s and the start of such traditions as RAGBRAI. Most of the first long-route independent trails were constructed in the early 1980s on former railroad rights-of-way, which crisscross Iowa and at one point connected practically every city in the state to a national freight and passenger transportation network (Figure 5.1).

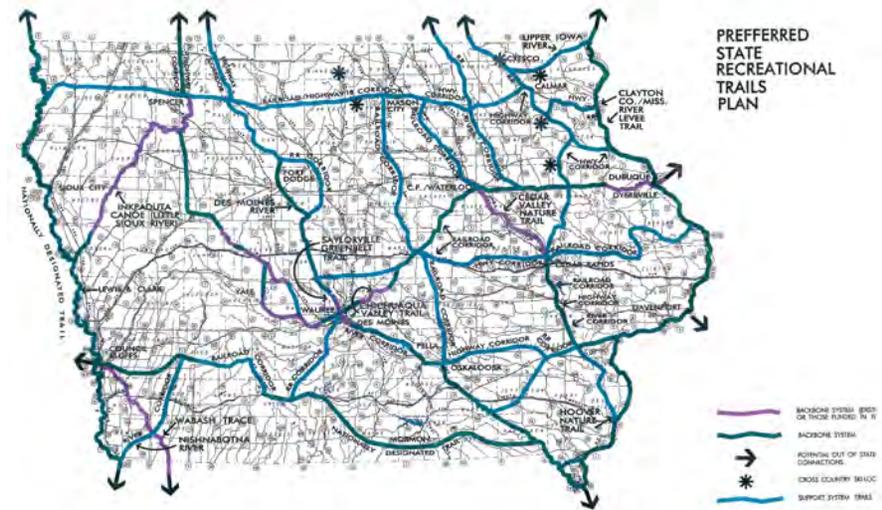
Figure 5.1: Iowa Railroad Map (1895)



The initial plan for a formal statewide trail network started in 1973 with a focus on recreation, rather than transportation. The Iowa State Conservation Commission (now the Iowa Department of Natural Resources) set forth to find natural, cultural, and historic treasures in Iowa that would help provide the groundwork for potential trail routes. The plan suggested that the assembled corridor system be used to serve as a guide in planning a statewide trail network but it did not address how to implement, manage, or fund the system.

In 1987, public demand for quality outdoor recreational facilities prompted the Iowa Legislature to take action. Lawmakers asked the Iowa DOT to develop a more detailed statewide trail plan. After conducting extensive research and collecting an inventory of data, the *Iowa Statewide Recreational Trails Plan* was published in 1990 (Figure 5.2). At this point, approximately 400 miles of the statewide system were in place. This plan included approximately 2,928 corridor

Figure 5.2: Iowa Statewide Recreational Trails Plan (1990)





miles, slightly more than half of which was considered the “backbone” system (longer corridors that run parallel to Iowa’s most significant natural resources, span state boundaries, or provide connections to major cities). This plan introduced the concept of classifying trails based on national, statewide, regional, or multicounty significance.

In 2000, the Iowa DOT published *Iowa Trails 2000* (Figure 5.3), which reported that approximately 1,180 miles of trails, many of which have less-expensive granular surfacing rather than asphalt or concrete, had been built as part of the system (a construction rate of approximately 78 miles of trails per year between 1990 and 2000). *Iowa Trails 2000* proposed an expanded statewide vision to include 4,391 miles of trails. All trails in the state, whether built by state agencies, cities, local groups, or county conservation boards, were considered part of the statewide trails vision. While the plan identified general corridors and trail location criteria, specific alignments, trail use, trail surface,

and other detailed design issues were to be determined by the agency or group that implemented the trail, and by subsequent planning efforts. Based on the 1990-2000 rate of trail construction, the statewide trails vision would be complete in approximately 56 years.

During the 2000s, the Iowa DOT determined that in order for the DOT to most effectively invest its limited resources in a multi-use trail system, a smaller, more focused network needed to be established. Between the adoption of the Iowa Trails 2000 plan and the Iowa in Motion 2040 plan (discussed on the following page) the Iowa DOT identified five trails of statewide significance from the statewide trails vision map. These trails provide high-level connectivity with other major trails in Iowa and, in some cases, trails in other states. Development of some of these trail corridors was envisioned to involve improving primary highways and county roads with paved shoulders, constructing multi-use trails, and in some cases,

Figure 5.3: Iowa Trails 2000 Statewide Trail Vision

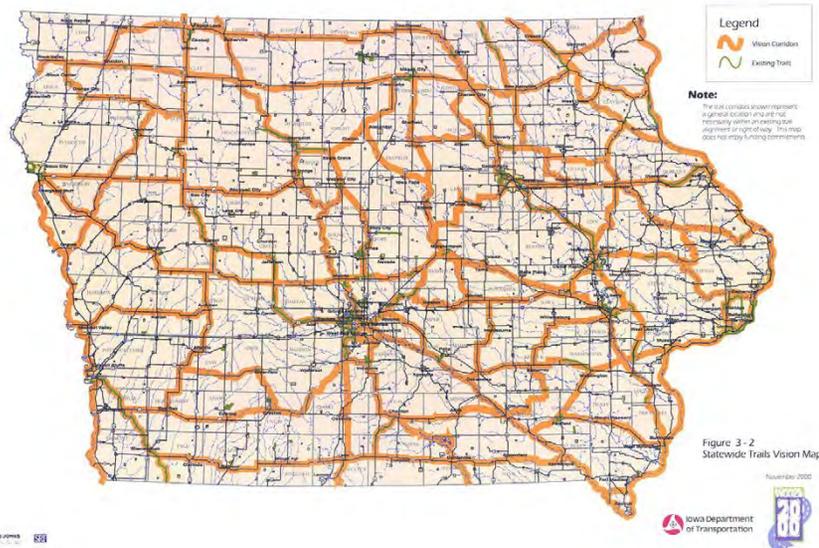
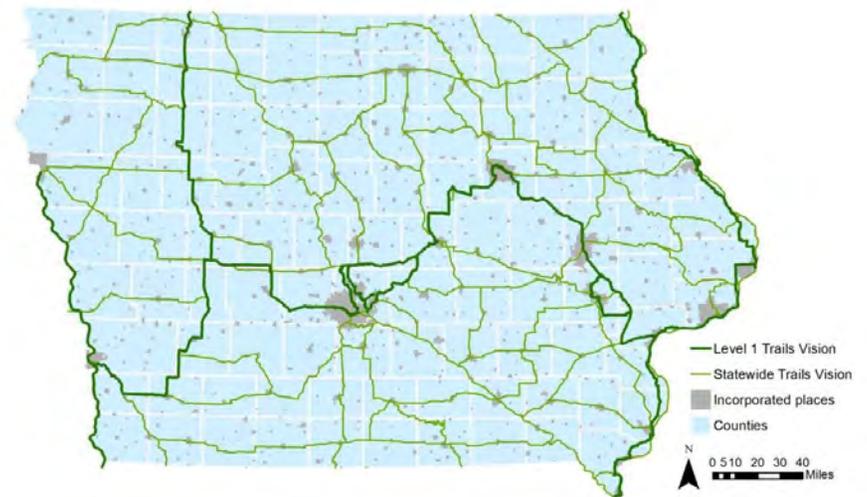


Figure 5.4: Iowa in Motion 2040 Trails Vision Map

This map identifies the five Level 1 Trail corridors, and also illustrates the Statewide Trails Vision from prior planning documents. It is assumed that the trails on the Statewide Trails Vision would be considered Level 2, or regional trails.



merely signing bike routes along low-traffic primary highways and county roads without making infrastructure improvements. This determination signified a shift away from a focus on a statewide network of multi-use trails to a network of mixed-facility “trail” routes. The five trails of statewide significance included:

- American Discovery Trail – envisioned as a continuous multi-use trail but currently predominately utilizes on-road routes
- Mississippi River Trail – envisioned as a mixed facility route, mostly on paved shoulders
- Lewis and Clark Trail – envisioned as a mixed facility route, mostly on shared roadways
- Iowa Great Lakes Connection – envisioned as a multi-use trail, with potential for interim use of shared roadways and paved shoulders
- Central Iowa Trail Loop – envisioned as a multi-use trail

Adopted in 2012, Iowa’s previous long-range transportation plan (*Iowa in Motion – Planning Ahead 2040*) projected the demand for transportation services out to 2040. Building on the prior work of *Iowa Trails 2000*, *Iowa in Motion* separated multi-use trails into three functional classifications:

- Level 1 – Trails of statewide significance
- Level 2 – Trails of regional significance
- Level 3 – Trails of local significance

Each of the five Level 1 trail corridors (see Figure 5.4) was evaluated to determine whether the “trail” route would likely be an on-road route along a primary highway or county road, or be constructed as a separated multi-use trail. The specific alignment, type of improvement, and responsible jurisdiction would be determined at the time of project development. The adoption of this plan further shifted the focus from an exclusively multi-use trail network toward mixed-facility routes for the Level 1 system.

5.3 Updated Statewide Trails Vision

The emphasis on the five Level 1 Trails introduced over the last decade was intended to focus the Iowa DOT’s resources and funding mechanisms to create a backbone system for the statewide trail network. However, this focus has arguably set priority on trail corridors that are not yet in demand by Iowans. Trails in Iowa are typically built by expanding existing networks and seizing opportunities as they arise. In most cases, the successful development of a trail requires the organized determination and commitment of local and regional governments, interest groups, and individual citizens to create the momentum needed. While this sometimes includes segments of Level 1 Trails, more often than not, the trails that are prioritized by communities, MPOs, RPAs, and the public are not part of one of these five corridors. Furthermore, there is an expectation that a “trail” is a paved bicycle and pedestrian path separated from motor vehicle traffic. While the continued development of national “trail” routes (such as the Mississippi River Trail, which is primarily composed of on-road routes) remains important, the consensus among local and regional governments, interest groups, and citizen stakeholders is to primarily use “trail” funding to develop true multi-purpose trails, and only occasionally to fund on-road bicycle accommodations when significant opportunities arise.

Therefore, as identified in Iowa’s current long-range transportation plan, *Iowa in Motion 2045*, the vision for Iowa’s statewide trail system is returning to its original conception—a statewide network of separated multi-use trails that connects rural communities, metropolitan areas, state and county parks, and natural amenities. The prioritization of projects will be based on the trail’s ability to improve access and connectivity rather than on its functional classification. The Level 1-3 classification scheme will no longer be used. Rather, trails in Iowa will be classified as part of the Statewide Trails Vision or as a secondary connecting trail of local importance. This new classification will have an effect on prioritization for funding, but will not be an overriding determinant.



Current status

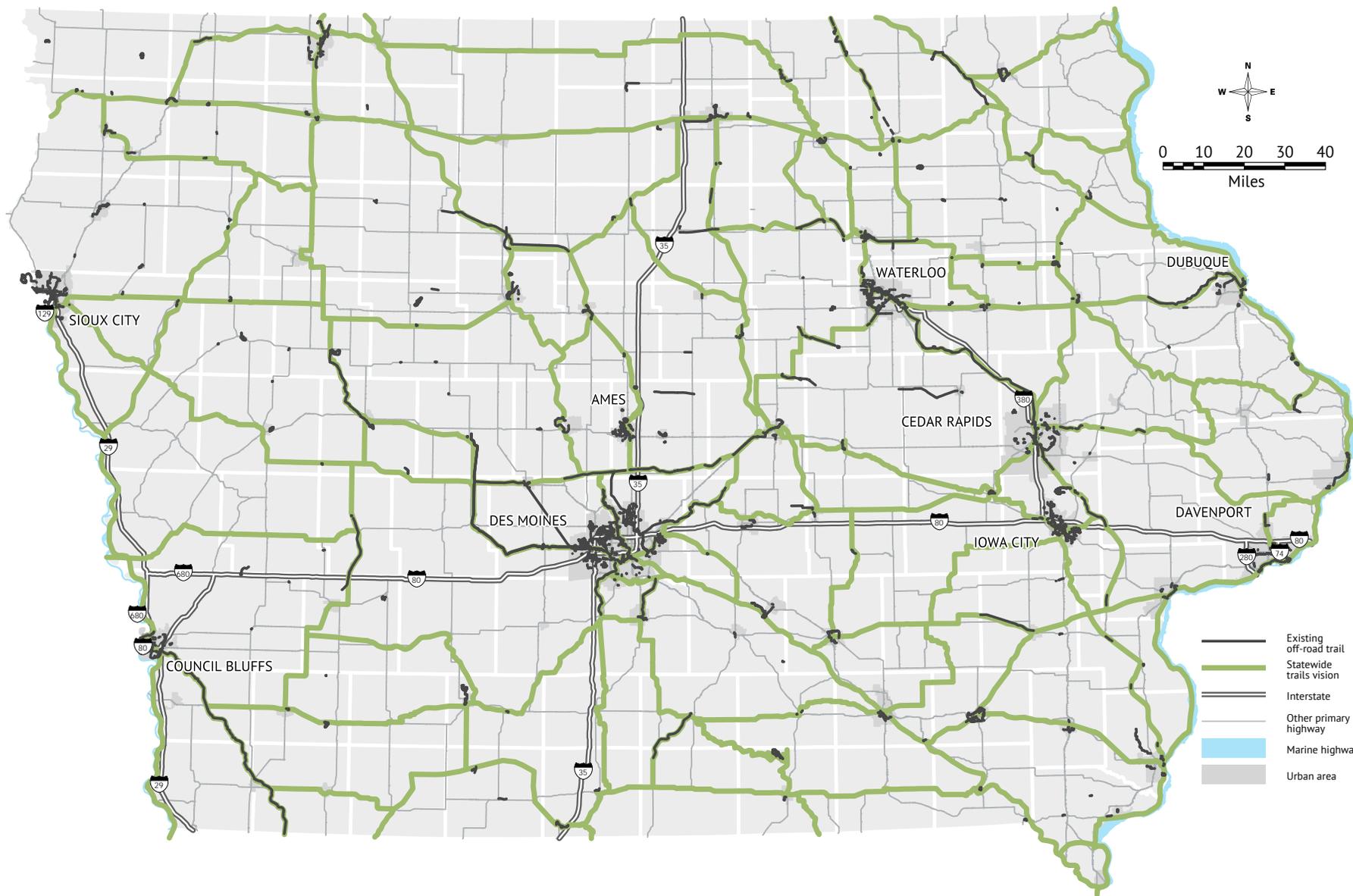
The Statewide Trails Vision map (Figure 5.5) is a compilation of the trail planning efforts completed over the last few decades. The network of completed trails has been updated to accurately depict the routes that have been constructed to-date. The vision map is not intended to depict a full build-out of all trail segments across the state of Iowa. Rather, it should be utilized as a planning tool so that development opportunities can be pursued as they arise. As local public agencies and planning organizations continue their trail planning efforts, the vision map will continue to evolve. The goal of the statewide map is to encourage consistent and continuous planning across jurisdictional and planning boundaries.

Included on the map is a depiction of the level of completeness of the system. This was determined based upon past studies; known construction completion; a comparative analysis with trail planning efforts; and interviews with communities, planning organizations, and the INHF. Various planning organizations and local governments have ongoing trail planning efforts that could alter the network as proposed. At this point, the envisioned system is approximately 40 percent complete. The 1,990 existing miles of multi-use trails include mostly asphalt, concrete, and crushed stone surfaces. In some cases, the trails are simply graded earth. At the time of writing, 475 miles of trails are programmed, meaning they are funded and/or under design, or are planned as part of an adopted local or regional trail plan. The majority of the envisioned network is currently proposed.

Table 5.1: Statewide Trails Vision – Current status

Trail Status	Mileage	% of Statewide Network
Existing	1,990 miles	36%
Planned or Programmed (part of an adopted local or regional trail plan)	475 miles	9%
Proposed (by this Long-Range Plan)	3,047 miles	55%
Total Statewide Trails Vision Mileage	5,512 miles	100%

Figure 5.5: Statewide Trails Vision for multi-use trails





Cost estimates

While every trail is unique, it is possible to estimate an approximate cost per mile based on historical project data. In recent years, hundreds of miles of trail have been constructed in Iowa. An analysis of the construction costs shows that trails built on abandoned railroad grades are less expensive per mile than trails built on virgin land, while trails in cities or those requiring significant grading are among the most expensive.

Per mile costs for varying types of accommodations, based on recent historical construction costs, are presented in the following table. The modification factors are multipliers used to adjust the base cost per mile depending on varying conditions. For example, the typical cost per mile for a multi-use trail on former railroad grade is \$200,000 (0.5 modification factor times the \$400,000 base cost) and the typical cost per mile for a new sidepath along a rural roadway is \$480,000 (1.6 times \$300,000).

Table 5.2: Typical per mile cost estimates for multi-use trails based on historic costs in Iowa

Facility Type	Typical Cost per Mile	Modification Factors	
New paved multi-use trail on independent alignment, 10' wide	\$400,000	Former RR grade	0.5
		Flat terrain	0.6
		Rolling terrain	1.0
		Hilly terrain	1.2
		Along stream bank	1.2
		Densely developed area	2.0
New paved sidepath, 10' wide	\$300,000	Along urban roadway	1.0
		Along rural roadway	1.6
		Densely developed area	1.4
Unpaved multi-use trail	\$200,000	Former RR grade	0.6
		Flat terrain	1.0
		Rolling terrain	1.2
		Hilly terrain	1.4

5.4 Trail system funding, management, and maintenance

Funding sources and levels

Iowa has a number of available funding streams that can be used for the development of the Statewide Trail Network. Those that are administered by the Iowa DOT include Federal Recreational Trails, the State Recreational Trails Program, and the Surface Transportation Block Grant-Transportation Alternatives Program (part of the Federal funding the state receives under the current FAST Act transportation funding bill). Each of these is a dedicated funding source, meaning that all of these funds are predominately allocated to bicycle and pedestrian projects. There are also several funding programs that are not administered by the Iowa DOT. The Iowa DNR's Resource Enhancement and Protection (REAP) program provides funding for state and local projects, including trail corridor preservation. Other programs and grants such as Vision Iowa, legacy funds, and corporate donations also contribute much needed funding for trail development.

The level of funding available for multi-use trails is inconsistent. For example, while Iowa's State Recreational Trails Program had \$6 million budgeted for FY2014, the amount of funding available through this program was half that in previous years. In 2016 the program was funded at \$2.5 million and in 2017 the program is funded at \$1 million. Furthermore, as with past federal transportation acts, there is a level of uncertainty regarding future funding beyond the FAST Act, and therefore the Surface Transportation Block Grant-Transportation Alternatives Program.

The most effective way to validate trail development as a statewide goal is to increase the level of funding within any program devoted to bicycle and pedestrian accommodation improvements. The Statewide Trails Vision includes thousands of miles of trail that have been identified and could be developed in the state. Multi-use trail projects will continue to be primarily funded by these dedicated funding programs (such as STBG-TA, State RTP, Federal RTP, etc.), except for trails built along roadways as parts of roadway projects. While it is not

reasonable to assume that every mile will be funded during the life of this plan, it is important that overall funding levels be increased so that trail development can better meet demand. Furthermore, it is important to make funding for multi-use trails more dependable. One way in which to work toward this goal is for the Iowa General Assembly to increase the state's sales tax, thereby funding the Natural Resources and Outdoor Recreation Trust Fund (Iowa Land and Water Legacy), which will provide approximately \$15 million in funding for trails per year under the originally developed formula. It will be the responsibility of regional agencies, local governments, and partners to identify priority projects for the Iowa DOT and Iowa DNR to fund.

Management and maintenance

It is the role of partners such as the INHF, MPOs and RPAs, and local jurisdictions to plan, acquire right-of-way, design, build, and maintain multi-use trails in Iowa. The Iowa DOT's role in the development and management of multi-use trails has historically been to provide funding and assist with building projects by helping local agencies with design, letting, and construction processes. With the potential exception of providing technical support for the planning and design of multi-use trails, the Iowa DOT's role will generally not change. While several public funding streams are available for the planning, design, and construction of new trails, maintenance costs typically fall solely on the local jurisdictions. At a minimum, these costs must be understood and acknowledged by the participating governments, and a plan for the permanent maintenance of the facility should be prepared.

Table 5.3 lists typical maintenance items that should be included in local and regional trail management plans.

When trail systems become interconnected, it can be advantageous for multiple entities to share resources, potentially with the goal of creating a trails authority. The creation of a trails authority with the ability to generate revenue would require enabling legislation, but



could serve a critical role in trail maintenance and management since the Iowa DOT has not historically been involved in the matter after a trail is constructed.

Another opportunity to maintain multi-use trails in a cost-effective manner is the establishment of non-profit foundations and “friends” groups (e.g., “Friends of the ____ Trail”) that help to fund maintenance of trails as well as provide safety patrols and promote the use of a trail or trail system. Examples in Iowa include the Cedar Trails Partnership, which is a non-profit that coordinates with multiple jurisdictions and manages a grant program to support the development and maintenance of the 100-plus mile Cedar Valley Trails system. Another example is the Friends of the Red Oak Trails, which helps to plan, promote, and maintain a short loop trail in the City of Red Oak.

Table 5.3: Typical maintenance activities for multi-use trails

Maintenance Activity	Frequency	Responsible Party
Mowing	Weekly or bi-weekly	Local jurisdiction
Weed control	Spring, then as needed	Local jurisdiction
Tree/branch trimming	Spring, then as needed	Local jurisdiction
Sweeping	Bi-weekly or as needed	Volunteers / local jurisdiction
Snow removal	As needed	Local jurisdiction
Garbage clean-up	Bi-weekly or as needed	Volunteers / local jurisdiction
Storm clean-up	As needed	Local jurisdiction
Striping/pavement markings	As needed, ~ 1-2 years	Local jurisdiction
Signage replacement	As needed, ~ 5 years	Local jurisdiction
Graffiti removal	As needed	Local jurisdiction
Shoulder grading	As needed, ~ 1-2 years	Local jurisdiction
Crack sealing	As needed, ~3-5 years	Local jurisdiction
Pavement repair patching	As needed, ~ 5 years	Local jurisdiction
Pavement replacement	As needed, ~ 25-50 years	Local jurisdiction

Summary of trail funding, management, and maintenance recommendations

- Increase the level of funding within existing funding programs devoted to bicycle and pedestrian accommodation improvements.
- Approve sales tax increase to fund the Natural Resources and Outdoor Recreation Trust Fund (Iowa Land and Water Legacy).
- Encourage participating agencies and organizations to develop plans for the permanent maintenance of trail facilities.
- Consider creating one or more trails authorities with the ability to generate revenue in order to maintain and manage trails across the state.
- Explore the creation of additional local foundations and friends groups to help fund the maintenance and patrol of trails.

5.5 National trails and US Bicycle Routes

Cross-country routes for bicycling and walking have been envisioned over the past several decades in a variety of ways. One origin of the concept was Bikecentennial, a coast-to-coast bicycle ride that occurred in the summer of 1976. The tour route was eventually designated as US Bicycle Route 76 and became the inspiration for a national grid of on-road routes for long-distance bicycle touring—the United States Bicycle Route System (USBRS). Other long-distance routes not directly associated with the USBRS have also been planned and partially implemented across the country. Some are envisioned as completely separated trails for hiking, others are predominately for on-road bicycling, utilizing low-volume roads and paved shoulders, and some are planned to utilize a mix of multi-use trails and on-road accommodations.

The US Bicycle Route System planning effort (the National Corridor Plan, see Figure 5.6) is a partnership between the Adventure Cycling Association (ACA) and the American Association of State Highway Transportation Officials (AASHTO). The vision entails more than 50,000 miles of interstate routes passing through each of the lower 48 states as well as six short routes wholly within Alaska. To date, nearly 12,000 miles of US Bicycle Routes have been approved in 25 states. For proposed US Bicycle Routes, the National Corridor Plan identifies 50-mile wide corridors, which are flexible based on opportunities for implementation. The plan states that it relies on state DOTs to determine the best route along each corridor and that the plan is open to expanding the system via spur and loop routes as well as new corridors. There are currently five proposed routes in Iowa. Route 51 runs north-south through the center of the state, Route 40 and Route 36 run east-west across the center of the state, Route 45 follows the Mississippi River, and Route 55 follows the Missouri River. For Routes 45 and 55, the plan is not specific as to which side of the river (and therefore in which state) the route is to be located.

In addition to the proposed routes identified by the National Corridor Plan, there are hundreds of “Alternate Corridors” across the country, including six in Iowa. The Alternate Corridors are interstate or connecting routes identified during the National Corridor Plan effort that were not prioritized and assigned a route number. There may be value in the future development of one or more of these corridors in Iowa as regional or state on-road bicycle routes to supplement the USBRS and provide increased access and connectivity to destinations. If established, routes along the Alternative Corridors would help connect the USBRS with the regional bike route systems that are the responsibility of MPOs/RPAs, counties, and volunteer organizations to plan and develop.

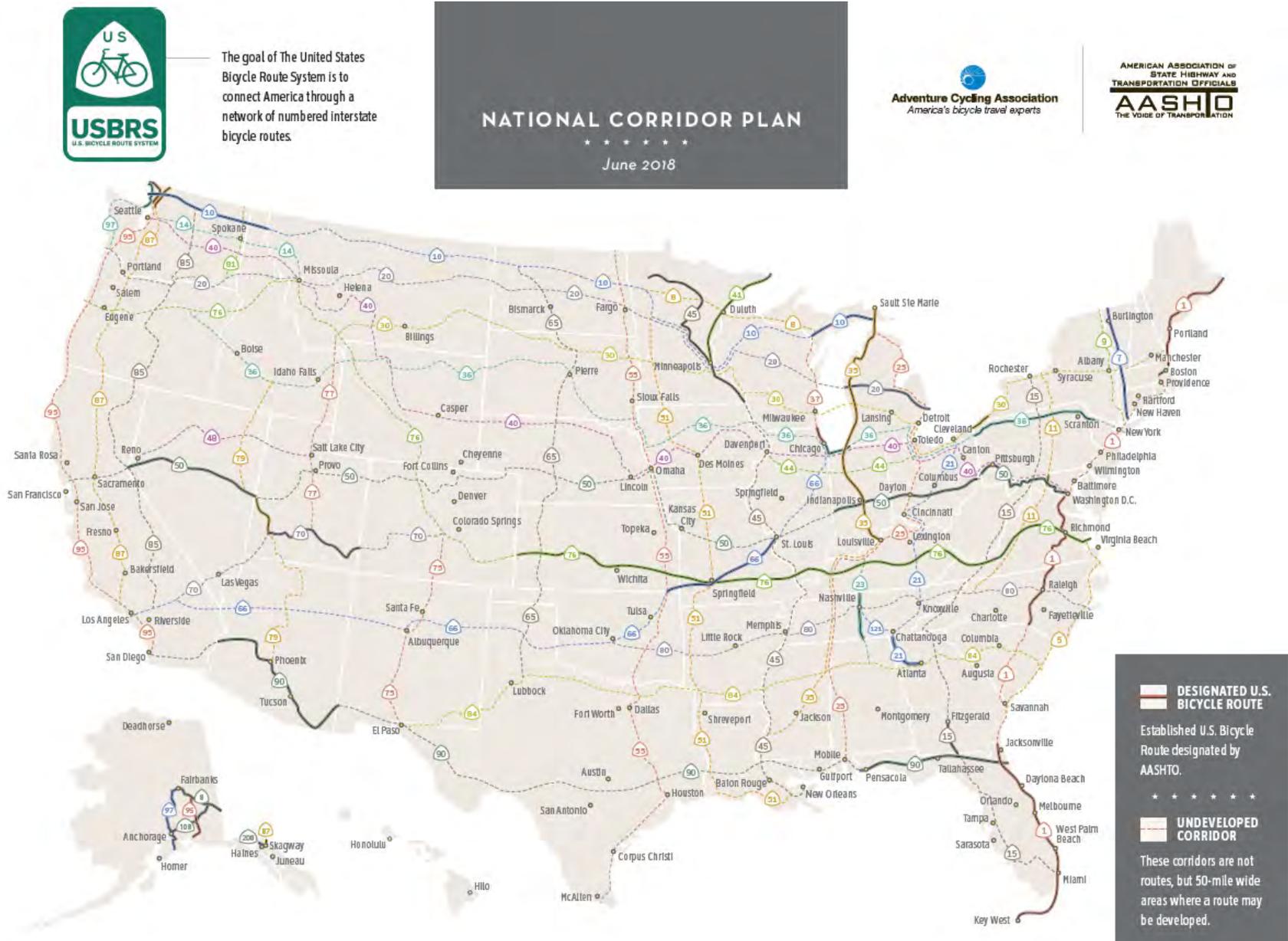
Three national trails pass through Iowa—the American Discovery Trail, the Mississippi River Trail, and the Lewis and Clark Trail. In the recent past, these were designated as three of five “Level 1” trail corridors, as discussed in the previous section.

While some of the multi-use trail segments (planned or existing) are considered by this plan to be part of the statewide trails vision network, the on-road portions are not. Still, further developing these corridors (as well as US Bicycle Route corridors) is important, primarily for expanding tourism and recreation opportunities, but also to a lesser degree for improving intercity transportation by bicycle. If the aforementioned US Bicycle Routes 45 and 55 are established in Iowa (rather than bordering states), they will follow the same alignments as the Mississippi River Trail and Lewis and Clark Trail, respectively.

The term “national trails” refers to a class of interstate non-motorized routes rather than a specific type of accommodation. National trails utilize separated multi-use trails, paved shoulders, and shared roadways.



Figure 5.6: The United States Bicycle Route System National Corridor Plan (June 2018)



5.6 Planned combined system

There are many similarities between the US Bicycle Route system and the national trails that pass through Iowa. For example, both are interstate and both rely heavily on on-road bicycle accommodations.¹ Therefore, they can be considered as one system for the purposes of this plan. A statewide network of US Bicycle Routes and national trails is not more or less important than the previously-discussed statewide network of multi-use trails; rather, it serves a different purpose. Establishing this predominately on-road system will open new possibilities for bicycle tourism and intercity travel by bicycle. It will also be faster to implement and significantly more economical to establish on a cost-per-mile basis since most of the alignments utilize low-traffic roads (so paved shoulders will not be required) and existing/programmed multi-use trails. Some roads will need accommodations, largely by way of paved shoulders. In general, the implementation of dedicated accommodations can be made concurrent with road reconstruction and 3R projects.

Table 5.4: National trail and USBR corridor status in Iowa

Corridor Name	Percent Complete
American Discovery Trail	70%
Mississippi River Trail (USBR 45)	35%
Lewis and Clark Trail (USBR 55)	0%
USBR 36	0%
USBR 40	0%
USBR 51	0%

¹ Approximately 34 percent of the American Discovery Trail is currently designated along rural roads (primarily shared roads, with some roads with paved shoulders) but the ultimate vision is for the ADT to exist as a coast-to-coast separated path.

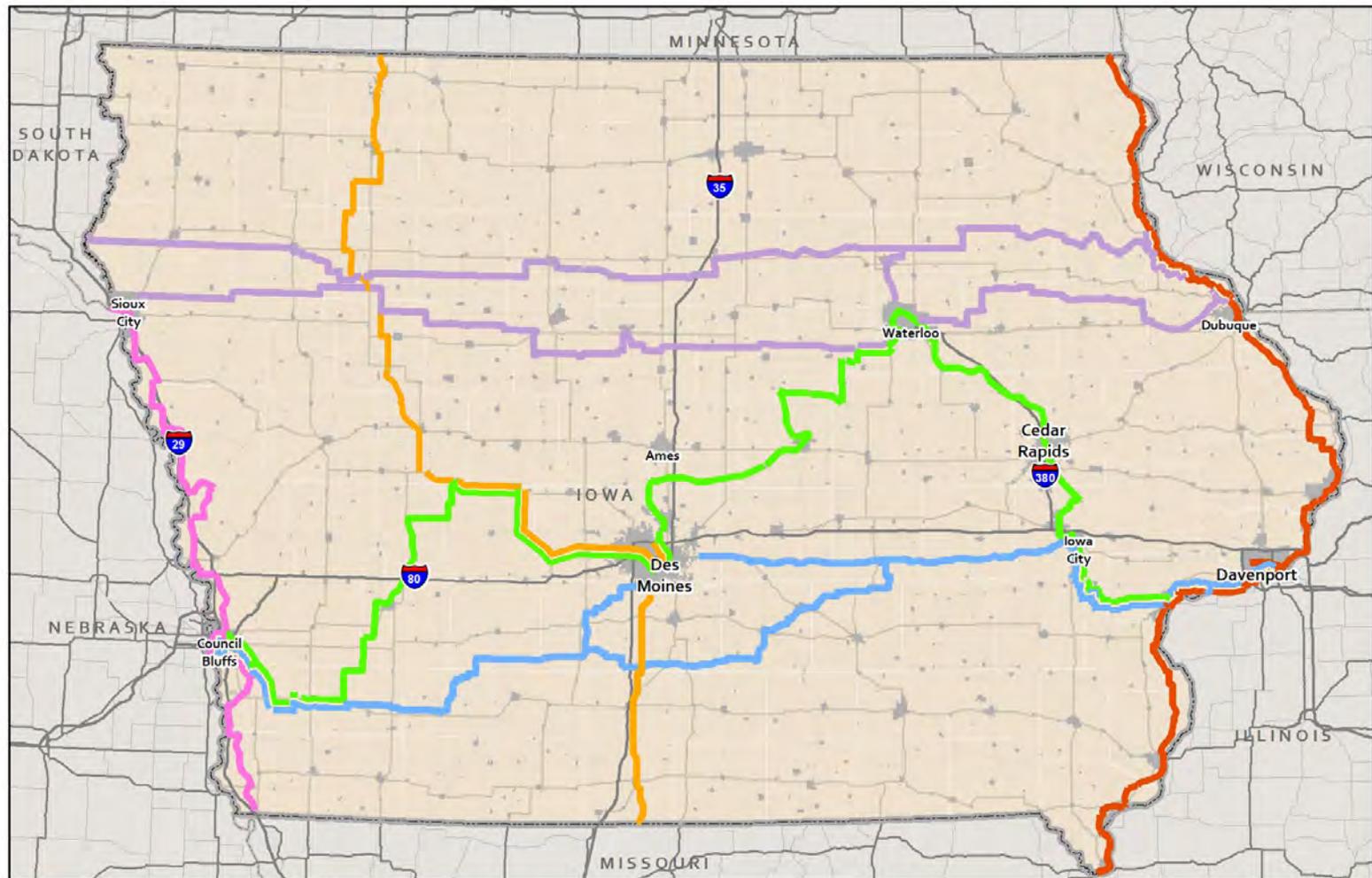
The planned system, shown on the following map (Figure 5.7), combines the planned corridor alignments of the Mississippi River Trail/USBR 45, the Lewis and Clark Trail/USBR 55, and the American Discovery Trail, along with two alignment options each for USBR 40 and USBR 36. The planned routes for each of the three national trails (and therefore USBR 45 and 55) have been modified only as necessary to maintain continuity along the route if a constructed portion created a gap in a previously planned alignment. They have also been adjusted if the regional plan for a trail has been altered by the local public agency or planning organization.

Figure 5.7 shows the proposed alignments of all USBRs and national trails in Iowa. The routes were determined based on existing, planned, and proposed trails, paved shoulders, and low-traffic rural roads. The alignments of the routes and national trails are not definitive. As continued planning and design occurs, these routes may shift to take advantage of opportunities or to avoid barriers.

Figure 5.8 shows the planned or proposed facility type (multi-use trail, paved shoulders, shared road, etc.). Where specified simply as “on-road” (as opposed to paved shoulder or shared road), this means that the route would be on-road, but a determination has not yet been made as to whether a dedicated facility (e.g., paved shoulders) is needed. In terms of status, planned facilities are those that are included in a preexisting regional or local bicycle and pedestrian plan, programmed facilities are those that are funded and/or designed, and proposed facilities are those that are being introduced by this plan.



Figure 5.7: National trail and USBR system alignments (including two alignment options each for USBR 36 and USBR 40)



Bicycle & Pedestrian Long-Range Plan

Status of National Trail and USBR System

0 5 10 20 30 Miles

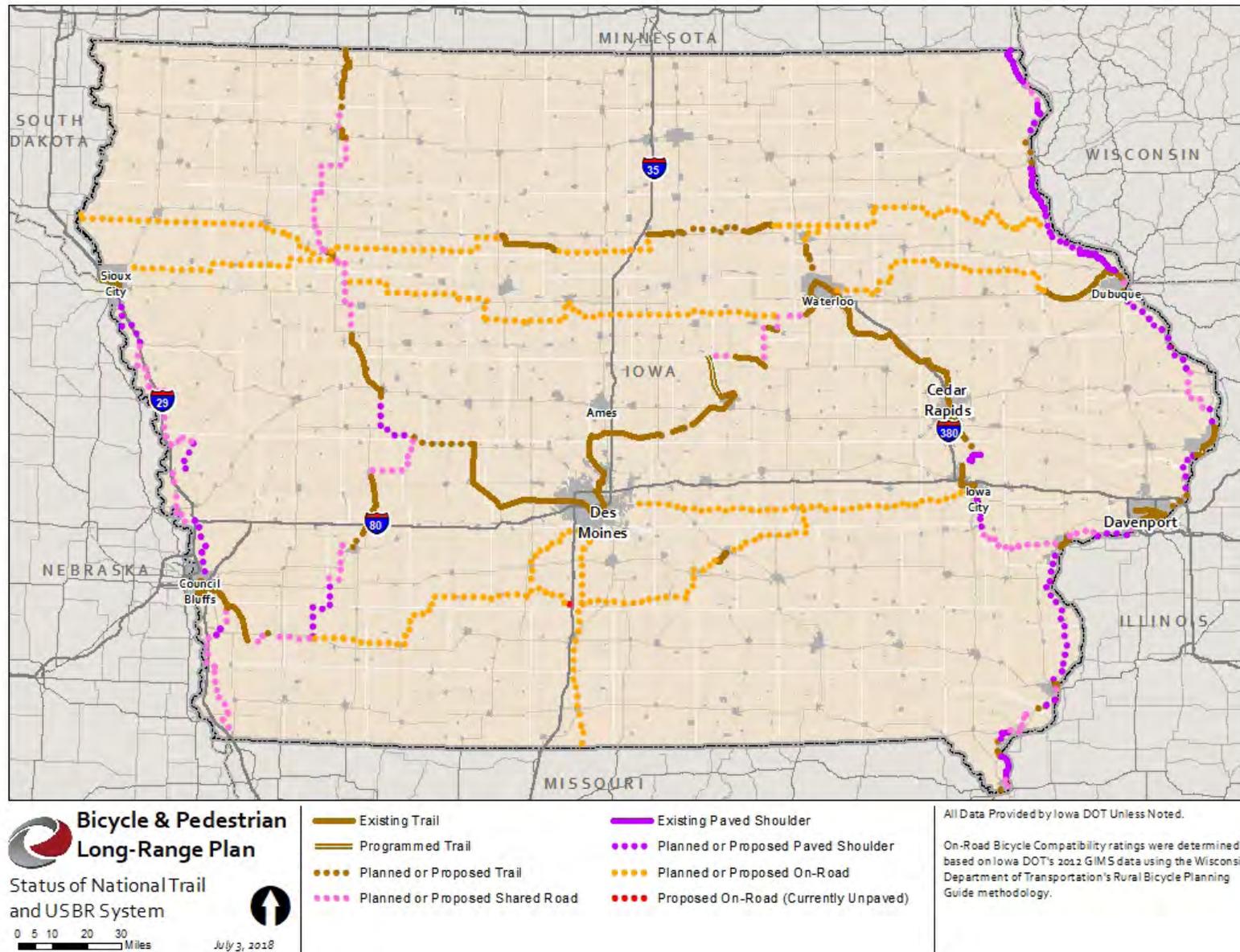
July 3, 2018

- American Discovery Trail
- Mississippi River Trail (USBR 45)
- Lewis & Clark Trail (USBR 55)
- USBR 36
- USBR 40
- USBR 51

All Data Provided by Iowa DOT Unless Noted.

On-Road Bicycle Compatibility ratings were determined based on Iowa DOT's 2012 GIMS data using the Wisconsin Department of Transportation's Rural Bicycle Planning Guide methodology.

Figure 5.8: Status of national trails and USBR system corridors





5.7 Segment analysis and cost estimates

Each of the National Trail and USBRS corridors is discussed on the following pages. For each corridor, an overview of its history, assessment of current status, and implementation discussion is provided. Table 5.5 outlines the typical per-mile cost estimates used in determining the total cost for completing several of the corridors. Modification factors are provided as multipliers to adjust the base cost per mile depending on varying conditions. It is important to point out that the estimated paved shoulder costs are not entirely associated with each USBR since the probable course of implementation is to provide paved shoulders as part of future reconstruction work, during which paved shoulders would likely be provided anyway based on traffic volume.

Table 5.5: National Trail and USBRS per-mile cost estimates based on historic costs in Iowa

Facility Type	Typical Cost per Mile	Modification Factors	
New paved multi-use trail on independent alignment, 10' wide	\$400,000	Former RR grade	0.5
		Flat terrain	0.6
		Rolling terrain	1.0
		Hilly terrain	1.2
		Along stream bank	1.2
		Urban retrofit	2.0
New paved sidepath, 10' wide	\$300,000	Along urban roadway	1.0
		Along rural roadway	1.6
		Densely developed urban	1.4
New paved shoulders, 5' wide both sides	\$175,000*	Adequate shoulder width present	1.0
		Embankment widening required	2.0
		As a standalone project (not part of a larger 3R** project)	1.2
Shared Lane/Road	\$500	Rural route generally follows one road with few turns (wayfinding signage)	1.0
		Rural route includes many turns onto different roads (wayfinding signage)	2.0
		Urban route (wayfinding signage and shared lane markings)	10.0

* The probable course of implementation is to provide paved shoulders as part of future reconstruction work during which paved shoulders would likely be provided anyway based on traffic volume. Paved shoulders provide many benefits such as reduced maintenance costs, reduction in run-off-road crashes, etc., so these costs should not be seen as solely for the benefit of bicycling and walking.

** Resurfacing, restoration, or rehabilitation. These projects are less intensive than reconstruction projects and are typically budgeted and scheduled the same year that they are completed.

American Discovery Trail (ADT)

In 1989 the American Hiking Society envisioned a coast-to-coast multiuse trail that would link cities, towns, wilderness areas, forests, and deserts. The ADT website (<http://www.discoverytrail.org>) refers to the trail as “a new breed of national trail—part city, part small town, part forest, part mountains, part desert—all in one trail.” Passing through 15 states, the ADT is more than 6,800 miles long and stretches from Cape Henlopen State Park in Delaware to Pt. Reyes National Seashore in California. This “trail” is composed of traditional separated multi-use trails (paved and unpaved) as well as on-road segments.

Figure 5.9: American Discovery Trail national and state alignments²



Table 5.6: Estimated completion cost for the American Discovery Trail in Iowa

Facility Type	Mileage	Total Cost Estimate
Paved Multi-Use Trails	162 miles	\$33.5 million
Paved Shoulders	17 miles	\$4.7 million*
Shared Lanes/Road	139 miles	\$80,000
Total	318 miles	\$38.4 million

* Paved shoulder costs attributed to the ADT will likely be lower as the probable course of implementation is to provide paved shoulders as part of future reconstruction work during which paved shoulders would likely be provided anyway based on traffic volume.

² Source: American Discovery Trail Society (discoverytrail.org)



Current Status

In Iowa, the trail route totals approximately 512 miles, much of it following existing multi-use paths, with undeveloped portions following assumed routes for future development or continued on-road accommodation. The ADT, which is approximately 70 percent complete as of 2018, follows portions of a number of existing multi-use paths including:

- Wabash Trace Nature Trail
- Pioneer Trail
- T-Bone Trail
- Cedar Prairie Trail
- Raccoon River Valley Trail
- Cedar Valley Lakes Trail
- Clive Greenbelt Trail
- Cedar Valley Nature Trail
- John Pat Dorrian Trail
- Hoover Nature Trail
- Neal Smith Trail
- North Liberty Trail
- High Trestle Trail
- Clear Creek Trail
- Heart of Iowa Nature Trail
- Iowa River Corridor Trail
- Comet Trail
- Riverfront Trail

Approximately 73 percent of the proposed rural on-road portions of the American Discovery Trail follow low-traffic roads that are considered “good” for bicycling based on the On-Road Bicycle Compatibility Rating analysis performed during this project.

Plan for Completion

Of the five routes discussed in this section (the three national trails and two US Bicycle Routes), the ADT is the most established at roughly 70 percent complete. Completing the ADT will entail constructing 162 miles of multi-use trail and designating 156 miles as on-road bikeways. The total cost for completing the American Discovery Trail in this form is estimated to be \$38.4 million (not including right-of-way acquisition), as shown on Table 5.6.

However, if Iowa’s segment of the ADT is to conform to the ultimate vision of a coast-to-coast separated trail, an additional 171 miles of multi-use trail will need to be constructed (in place of on-road bikeways), greatly increasing this cost.

Mississippi River Trail (MRT) / USBR 45

The MRT stretches from the river’s headwaters in Itasca, Minnesota south to the Gulf of Mexico. When finished, the MRT will link an approximately 3,000 mile route of trails and on-road bikeways through 10 states, including 335 miles in Iowa. Involving 10 states, the trail was planned and managed by an interstate organization known as Mississippi River Trail, Inc. The MRT is one of 16 National Millennium Trails, chosen in 2000 by the White House Millennium Council. The National Millennium Trails designation was given to interstate trails that “connect our nation’s landscape, heritage and culture and demonstrate our national commitment to improving the quality of life for all Americans” (Rodney Slater, US Secretary of Transportation, 1997-2001).

Figure 5.10: Mississippi River Trail National alignment

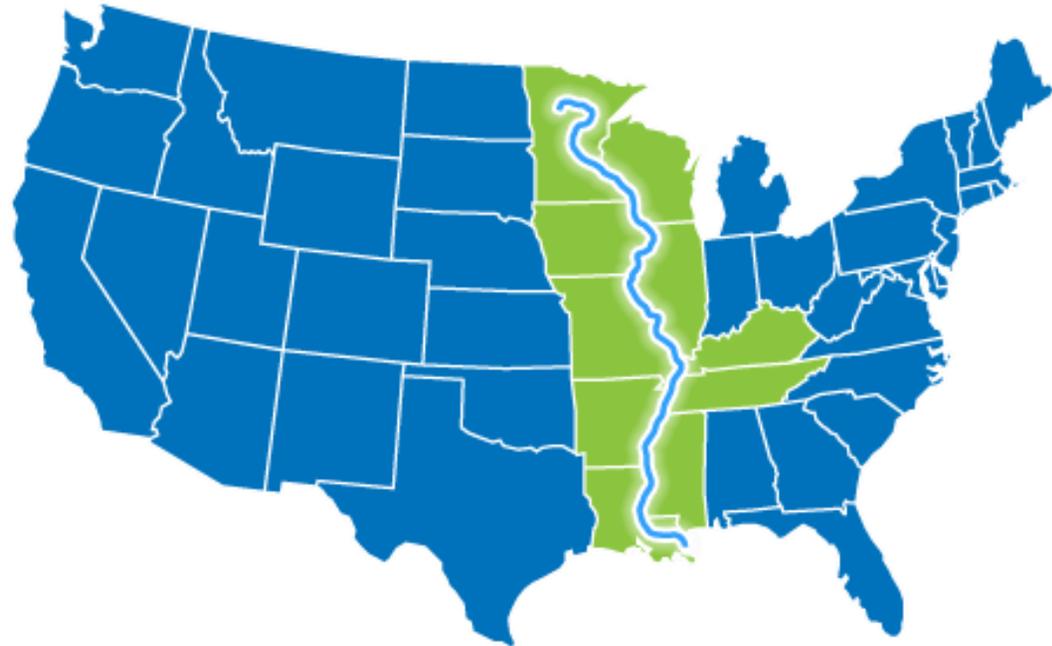


Table 5.7: Estimated completion cost for the Mississippi River Trail in Iowa

Facility Type	Mileage	Total Cost Estimate
Paved Multi-Use Trails	33 miles	\$12.2 million
Paved Shoulders	178 miles	\$47.8 million*
Shared Lanes/Road	30 miles	\$80,000
Total	241 miles	\$60.1 million

* Paved shoulder costs attributed to the MRT will likely be lower as the probable course of implementation is to provide paved shoulders as part of future reconstruction work during which paved shoulders would likely be provided anyway based on traffic volume.



Current Status

As of 2014, this trail is 35 percent complete in Iowa and much of it is still in the planning and development stages. Proposed segments that are not complete are generally still ride-able on existing county paved roads. The Iowa portion of the MRT was evaluated in the 2003 plan, *Iowa's Mississippi River Trail Plan*, to determine the best location for the route in Iowa. It was determined that in order to more quickly and economically begin implementing the route in Iowa, the majority of the trail would utilize the existing highway system, where feasible. Of the 335 miles of MRT in Iowa, 75 miles are recommended along primary highways, 140 miles along county roads, and 80 miles within municipalities. In addition, 20 miles of shared-use paths will need to be constructed. Some portions of the trail in Muscatine and Scott Counties will also serve as the American Discovery Trail. *Iowa's Mississippi River Trail Plan* calls for shoulders to be four to six feet wide (not including rumble strips) and paved with asphalt. In addition, about two miles of bridges may need to be re-decked in order to accommodate adequately-wide paved shoulders.

Plan for Completion

The 2003 *Iowa's Mississippi River Trail Plan* calls for a mix of multi-use trails and paved shoulders in rural areas. It does not recommend shared roads with wayfinding (which are much more economical than paved shoulders). Completing the MRT as planned will entail constructing 33 miles of multi-use trail (1.5 miles are currently programmed) and designating 208 miles as rural on-road bikeways (178 will require paved shoulders). The approach to implementing the MRT is incremental, taking advantage of reconstruction and 3R projects for the provision of paved shoulders. The total cost for completing the MRT will be \$60.1 million (2014 dollars, not including right-of-way acquisition), as shown on Table 5.7.

However, up to 48 miles of the route that is currently planned to include paved shoulders could instead be provided as shared lanes with wayfinding based on current and near-term traffic volumes and conditions. This would significantly reduce the cost of implementation.

Lewis and Clark Trail (LCT) / USBR 55

Lewis and Clark’s journey began in Washington D.C. and ended at the Pacific Ocean. The Lewis and Clark National Historic Trail, of which Iowa’s Lewis and Clark Trail is a part, begins at the Historic Camp Wood location on the Mississippi River near Saint Louis. The trail covers more than 3,700 miles and passes through 11 states. In Iowa, the Lewis and Clark Trail will extend from the South Dakota border at Sioux City to the Missouri border for a distance of approximately 150 miles along Iowa’s Missouri River Valley.

Figure 5.11: Lewis & Clark National Historic Trail alignment³



Table 5.8: Estimated completion cost for the Lewis and Clark Trail in Iowa

Facility Type	Mileage	Total Cost Estimate
Paved Multi-Use Trails	9 miles	\$1.8 million
Paved Shoulders	51 miles	\$13.7 million*
Shared Lanes/Road	135 miles	\$115,000
Total	195 miles	\$15.6 million

* Paved shoulder costs attributed to the Lewis and Clark Trail will likely be lower as the probable course of implementation is to provide paved shoulders as part of future reconstruction work during which paved shoulders would likely be provided anyway based on traffic volume.

3 Source: National Park Service (<http://www.nps.gov/lecl>)



Current Status

The Iowa DOT has developed a master plan for a Lewis and Clark Multiuse Trail. The Iowa DOT and its partners would like to see a network that weaves together roads, trails, waterways, parks, and greenways for modern day explorers and also helps people discover the towns, businesses, museums, open spaces, and assets of western Iowa and surrounding areas. The plan's overall goal is to make the landscapes and natural and human history of the Missouri River Valley and the Loess Hills more accessible to a wide variety of users for recreational, transportation, educational, and economic development purposes.

According to the study, the proposed route uses several different facility types. Because of the lack of abandoned rail corridors and the difficulty of acquiring right-of-way from private owners, the majority of the trail makes extensive use of existing public rights-of-way such as state and county roads and city streets.

To date, no portions of the LCT have been developed, although plans to sign the trail are now moving forward.

Plan for Completion

The *Lewis and Clark Multiuse Trail Study* includes numerous loops and bypass routes in addition to the primary north-south route. Completing the primary north-south route of the LCT will entail constructing 9 miles of multi-use trail and designating 195 miles as on-road bikeways (51 will require paved shoulders). The total cost for completing the initial primary north-south route of the LCT will be \$15.6 million (not including right-of-way acquisition), as shown on Table 5.8.

US Bicycle Route 36

Two portions of USBR 36—one through Pennsylvania and one through Indiana—are currently established. The remainder, however, is a prioritized corridor for future establishment. From east to west, it originates in New York City, passes through northern Pennsylvania and Ohio, turns north to Detroit, runs south of Lake Michigan through northern Indiana, passes through Chicago at which point it shifts north, heads west, and crosses the Mississippi River at Dubuque. It leaves Iowa near Hawarden, runs through South Dakota and northern Wyoming, goes through Yellowstone National Park, passes through Idaho Falls and Boise, and terminates at USBR 76 in eastern Oregon.

Current Status

The National Corridor Plan shows USBR 36 heading from Dubuque, across the northern portion of the state to Sioux Falls, where it will eventually link up with the Lewis and Clark Trail/USBR 55. The identified route for USBR 36 generally follows low-traffic roads while also utilizing existing and planned multi-use trails. The route will connect Dubuque, Waterloo, Storm Lake, Sioux City, and numerous small cities in between. It will pass through valleys, agricultural areas, and state parks.

Two potential alignments have been identified for USBR 36:

Northern Option – Approximately 75 percent of the proposed rural on-road portions of the northern USBR 36 alignment option follow low-traffic roads that are considered “good” for bicycling based on the On-Road Bicycle Compatibility Rating analysis performed during this project.

Southern Option – Approximately 90 percent of the proposed rural on-road portions of the southern USBR 36 alignment option follow low-traffic roads that are considered “good” for bicycling based on the On-Road Bicycle Compatibility Rating analysis performed during this project. This alignment has approximately 35 more miles of on-road portions than the northern alignment.

US Bicycle Route 40

USBR 40 is a currently-unestablished prioritized corridor that begins in New York City, heads west across New Jersey and Pennsylvania, moves west to Cleveland, passes through north-central Indiana and Illinois, and reaches the Mississippi River at Davenport. It leaves Iowa near Omaha, heads toward Lincoln, Nebraska, cuts northwest to run through Nebraska’s Sand Hills area, passes through Casper, Wyoming, heads north into Montana, passes through Missoula, and terminates in Seattle.

Current Status

The National Corridor Plan shows USBR 40 generally following the American Discover Trail alignment. However, there is an alternative alignment for this USBR to follow a more southerly route across Iowa from Davenport to Council Bluffs, at which point it can cross the Missouri River into Omaha or follow the Lewis and Clark Trail north to Sioux City. This newly-proposed alignment would improve intercity connectivity between the Des Moines and Iowa City areas. This alternative southerly route splits near the Des Moines area to provide two options: to pass through the metro area or to bypass it.

Approximately 65 percent of the proposed rural on-road portions for the southerly alternative alignment for USBR 40 follow low-traffic roads that are considered “good” for bicycling based on the On-Road Bicycle Compatibility Rating analysis performed during this project.



US Bicycle Route 51

USBR 51 is an unestablished prioritized corridor recently added to the National Corridor Plan. This route begins in New Orleans, heads west toward Texas and runs north along the Texas/Louisiana and Oklahoma/Arkansas borders, passes through Springfield, Missouri, and heads north toward Des Moines. It then leaves Iowa near Spirit Lake and runs through western Minnesota until it merges with USBR 10 and USBR 20.

Current Status

The National Corridor Plan shows USBR 51 running due north to Des Moines, following a portion of the American Discovery Trail alignment toward Storm Lake, then north to Spirit Lake. As this is a newly-prioritized corridor, it has not been studied as much as USBR 36 or USBR 40.

Approximately 60 percent of the proposed rural on-road portions of USBR 51 follow low-traffic roads that are considered “good” for bicycling based on the On-Road Bicycle Compatibility Rating analysis performed during this project.

Great American Rail-Trail

The Great American Rail-Trail is a combination of completed trails, trails under construction, planned trails, and existing gaps, primarily on former rail lines and canal towpaths spanning from Washington, D.C. to Washington state. With gentle gradients, it is usable by those with wide-ranging abilities. As a proposal recently introduced to the state of Iowa by the Rails-To-Trails Conservancy (RTC), the concept has not been studied as much as the other national trails and US Bike Routes discussed previously in this section.

Current Status

The proposed development plan shows the Great American Rail-Trail running east-west across central Iowa from Davenport in the east to Council Bluffs in the west. The route runs primarily between Interstate 80 and US Highway 20, with portions of the possible routes generally following the American Discovery Trail alignment. As proposed, the Iowa DOT supports this alignment as it would link with the other two national trails that pass through Iowa, the MRT and LCT.