



8. IMPLEMENTATION



Achieving the vision

The ultimate goal of implementing the Bicycle and Pedestrian Long-Range Plan is to make walking and bicycling viable transportation options for all Iowans. Implementation of the plan will occur over many years and will require changes to funding practices and modifications to the planning and design processes of the Iowa DOT as well as city, county, and regional agencies. It also requires continued education for the general public and government agencies alike in order to recognize that biking and walking are valid modes of transportation and are central to daily life.

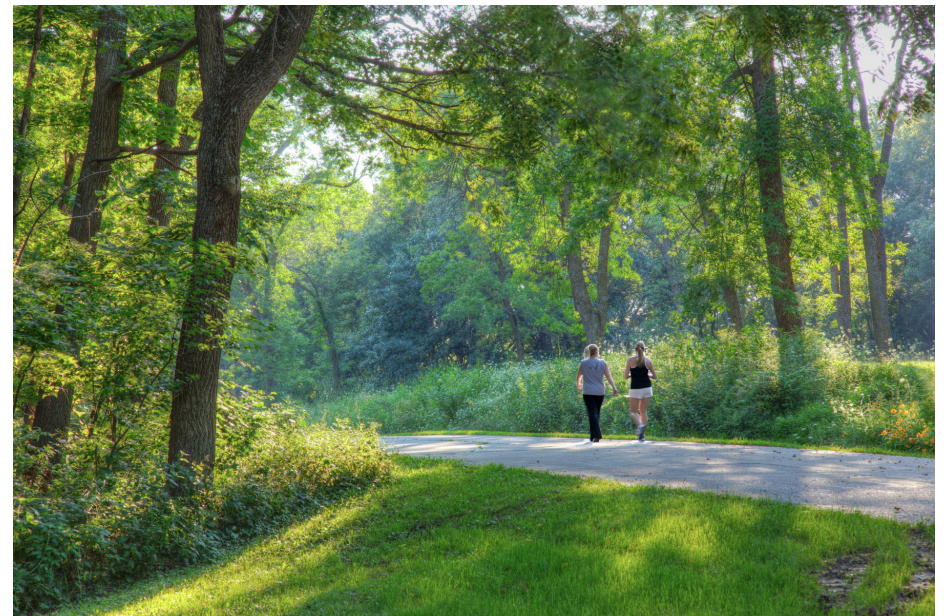
This chapter is structured as two sections:

- 1. Implementation actions** – this section sets forth a comprehensive implementation approach that includes engineering, education, enforcement, encouragement, and evaluation actions to be initiated and completed over several years.
- 2. Measuring the effectiveness of actions and investments** – this section includes a series of performance measures (used to track the outcomes of broad infrastructure and programmatic actions) and input measures (used to track the level of investment and input on the part of Iowa DOT and other implementing bodies).

8.1 Implementation actions

Implementation actions for the Bicycle and Pedestrian Long-Range Plan are divided into three time horizons and listed in the tables on the following pages.

- **Short-term actions** – The first steps to be taken toward implementing this Plan. These actions should be initiated as soon as possible, with the goal of having actions completed (or well-established in the case of on-going programs) within two to three years.
- **Mid-term actions** – These actions are intended to be initiated within the next one to three years and completed (or well-established in the case of on-going programs) within five to ten years.
- **Long-term actions** – Example long-term implementation actions to consider future needs beyond the life of this Plan.



8.2 Short-term actions

The first steps to be taken toward implementing this plan are those that affect the greatest change or those that require minimal investment. As such, most of the short-term implementation actions are policy and program-oriented. These actions should be initiated as soon as possible, with the goal of having actions completed (or well-established in the case of on-going programs) within two to three years.

Table 8.1: Short-term implementation actions

Action	Responsible	Timeline	Steps	Other considerations	Associated recommendations ¹
Implement the Complete Streets Policy.	Iowa DOT	By Spring 2019	<ul style="list-style-type: none"> • Complete policy • Train staff • Modify project development processes 	Requires modifying Iowa DOT's project scoping process as outlined in the Design Manual.	1.1, 1.3, 1.4 3.1 – 3.3 See Chapters 6 and 7
Modify Iowa DOT's project scoping process in accordance with the Complete Streets Policy.	Iowa DOT Highway Division	By Spring 2019	<ul style="list-style-type: none"> • Develop a one-stop comprehensive project scoping process guide • Distribute to staff 		1.1, 1.3, 1.4
Modify the Design Manual to uniformly comply with the latest version of national standards and best practices (AASHTO Guide for the Development of Bicycle Facilities, AASHTO Pedestrian Guide, and NACTO Urban Street Design Guide).	Iowa DOT Office of Design	By Spring 2019	<ul style="list-style-type: none"> • Develop an on-road bikeways section • Specify 4' minimum effective paved shoulder width for bicyclists • Add 5' sidewalks and bike lanes to urban typical sections 		1.3, 1.4 2.1 3.1 – 3.3
Modify the Bridge Design Manual to uniformly comply with the latest version of national standards and best practices (AASHTO Guide for the Development of Bicycle Facilities and NACTO Urban Street Design Guide).	Iowa DOT Office of Bridges and Structures Iowa DOT Office of Design	By Summer 2019	<ul style="list-style-type: none"> • Align bridge designer and county engineer judgment statements with the Complete Streets Policy • Add requirement to consider bicycle accommodations when determining bridge width 		1.3, 1.4 2.1 3.1 – 3.3

¹ See Chapter 3, Section 3.6



Table 8.1: Short-term implementation actions (continued)

Action	Responsible	Timeline	Steps	Other considerations	Associated recommendations ¹
Encourage modifications to SUDAS ² to uniformly comply with the latest version of national standards and best practices (AASHTO Guide for the Development of Bicycle Facilities, NACTO Urban Bikeway Design Guide, NACTO Urban Street Design Guide).	Iowa SUDAS Corporation with support from Iowa DOT and Iowa County Engineers Association	By Summer 2019	<ul style="list-style-type: none"> Copy revised sections from the Bridge Design Manual 		1.3, 1.4 2.3 3.1 – 3.3
Develop Complete Streets training for Iowa DOT staff as well as interested local and regional staff.	Iowa DOT Office of Systems Planning Iowa DOT Office of Design	Spring 2019	<ul style="list-style-type: none"> Develop training program Schedule workshops at each District office 		1.1, 1.3, 1.4 2.1, 2.3 3.1 – 3.3
Hold accessibility workshops designed to train local officials, agency staff, and professional engineers to effectively meet accessibility requirements on state, county, and local road projects.	Iowa DOT Central Office Iowa Bicycle Coalition	By Summer 2019	<ul style="list-style-type: none"> Identify case study examples of challenges in meeting accessibility requirements during the design process Work through potential solutions and strategies with participants 	This could be coordinated with the annual Bicycle Summit	1.2; 1.3, 1.4 2.1, 2.3 3.1 – 3.3
Designate one ³ licensed engineer in the Iowa DOT Central Office to be dedicated to providing technical assistance on bicycle and pedestrian facility design.	Iowa DOT Central Office	By Summer 2019	<ul style="list-style-type: none"> Determine responsibilities Determine appropriate division/office for employee 	This role could be addressed by modifying the responsibilities of one or more existing employees.	1.4 2.1, 2.3

² Statewide Urban Design and Specifications, the transportation infrastructure design manual used by municipalities and counties in Iowa.

³ One full-time equivalent (FTE).

Table 8.1: Short-term implementation actions (continued)

Action	Responsible	Timeline	Steps	Other considerations	Associated recommendations ⁴
Develop methodology for bicycle and pedestrian safety audits of high crash corridors and intersections to identify adequate countermeasures.	Iowa DOT FHWA Local jurisdictions	2019-2020	<ul style="list-style-type: none"> Identify high bicycle and pedestrian crash corridors and intersections Determine participants Conduct audits 	FHWA or Iowa DOT could lead, depending on format.	2.1 3.1 – 3.3 4.1, 4.4
Incorporate bicycle and pedestrian safety into the Strategic Highway Safety Plan (SHSP) and consider the interrelated impacts of projects funded by the HSIP program.	Iowa DOT Office of Traffic & Safety Iowa DOT Office of Systems Planning	By end of 2018	<ul style="list-style-type: none"> Identify the most common crash types/contributing factors Include strategies for reducing and ultimately eliminating bicycle and pedestrian crashes 		3.1 4.1, 4.2, 4.4
Enhance law enforcement curriculum for bicycle safety-related training.	Iowa DOT Iowa DPS Governor's Traffic Safety Bureau Iowa Bicycle Coalition	By end of 2019			4.2, 4.3 5.1 – 5.3
Develop and implement a Bicycle Awareness and Traffic Safety public relations campaign via web, billboards, dynamic message signs, bus advertisements, and other media.	Iowa DOT Office of Systems Planning Iowa DOT Office of Strategic Communications Iowa Bicycle Coalition	By Summer 2019	<ul style="list-style-type: none"> Identify primary messages Develop graphics and copy Procure billboard space, bus advertisement space, web hosting, etc. 	An example is the Iowa Bicycle Coalition's "Sharing the Road with Bicyclists" radio campaign. ⁴	4.3, 4.4 5.1 – 5.3
Support safety and skills training courses annually for adults and youth.	Iowa Bicycle Coalition Iowa DOT	By Summer 2019	<ul style="list-style-type: none"> Develop/acquire curriculum Recruit and train instructors Identify local partners for hosting, advertising, etc. 	Instructors should be League Cycling Instructors (LCI), which costs \$300 for certification.	5.1 – 5.3

4 <http://traffic.iowabicyclecoalition.org/radio/>



Table 8.1: Short-term implementation actions (continued)

Action	Responsible	Timeline	Steps	Other considerations	Associated recommendations ¹
Identify the primary urban and rural crash types occurring in Iowa and develop strategies for reducing crashes.	Governor's Traffic Safety Bureau (DPS) Iowa DOT	By end of 2018	<ul style="list-style-type: none"> Review crash data for previous 5-10 years Review crash reports to identify crash types 	Coordinate with the development of the Strategic Highway Safety Plan and FHWA-led safety audits.	1.3, 1.4 3.1 – 3.3 4.1 – 4.4
Review road project prioritization criteria to consider the project's potential benefits to bicycling and walking.	Iowa DOT MPOs & RPAs	By end of 2019	<ul style="list-style-type: none"> Consider criteria that prioritizes projects that follow the Complete Streets process. 		1.3, 1.4 2.4 3.1 – 3.3 See Chapter 7
Develop clear and consistent criteria to prioritize funding for stand-alone bicycle and pedestrian projects, consistent with the Complete Streets Policy.	Iowa DOT	By end of 2019	<ul style="list-style-type: none"> Develop criteria that prioritize projects that have the greatest impact on improving access and connectivity. 	Create a consistent methodology to apply to State RTP, TAP, and other dedicated funding programs.	2.1, 2.2 3.1 – 3.3 See Chapter 7
Apply for US Bicycle Route Designation for USBR 36, 40, 44, 51, and 55 (applications submitted to AASHTO).	Iowa DOT Affected Jurisdictions Advocates	TBD	<ul style="list-style-type: none"> Review routes in detail with stakeholders. Develop or revise maps and turn-by-turn details. Coordinate with bordering states. Secure resolutions of support from cities, counties, and regional agencies. Prepare applications. 	Concurrently, implementation plans should be developed or updated to deploy route signage and prioritize infrastructure improvements (e.g., paved shoulders) where necessitated by traffic volumes.	2.2 3.3

8.3 Mid-term actions

Implementation actions in the mid-term category are important, but are more challenging to initiate or are dependent on the groundwork laid by the short-term actions. These actions are intended to be initiated within the next one to three years and completed (or well-established in the case of on-going programs) within five to ten years.

Table 8.2: Mid-term implementation actions

Action	Responsible	Associated recommendations ⁵
Encourage and work with cities, counties, and MPOs/RPAs across the state to adopt Complete Streets policies using the Iowa DOT's Complete Streets Policy as a model.	Iowa DOT Cities Counties MPOs/RPAs Advocates	1.1 3.1 – 3.3 See Chapter 6
Support MPOs and RPAs in the development and adoption of bicycle and pedestrian plans that are coordinated with the statewide Long-Range Plan.	Iowa DOT MPOs/RPAs Advocates	2.2 – 2.4 3.1 – 3.5
Identify barriers and gaps in the state highway system for bicycling and walking that will not be corrected by planned reconstruction/3R activities and develop alternatives for providing adequate interim connections, especially in cities and metro areas.	Iowa DOT	1.2 3.1 – 3.5
Explore options for increasing the amount of dedicated funding allocated to bicycle and pedestrian projects and programs.	Iowa DOT Advocates	See Chapter 7
Develop and implement statewide maintenance and work zone guidelines to address bicyclist and pedestrian needs. These guidelines should be adaptable to city, county, and Iowa DOT maintenance and work zone responsibilities.	Iowa DOT Counties	1.5 2.2 – 2.4
Work with transit agencies across the state to provide bike racks on all compatible buses. This may include identifying a funding source for this relatively inexpensive action and/or developing product and operational guidelines to assist agencies with implementation.	Iowa DOT MPOs/RPAs	2.3 3.4

⁵ See Chapter 3, Section 3.6



Table 8.2: Mid-term implementation actions (continued)

Action	Responsible	Associated recommendations ⁵
Develop encouragement programs and events to get more people walking and bicycling. This includes designing safety and how-to materials, training courses, maps, and other education efforts that espouse the health, safety, environmental, and economic benefits of biking and walking.	Advocates Iowa DOT Iowa Department of Public Health	5.1 – 5.4
Recommend a safe passing law that requires drivers to change lanes when passing another vehicle (including cars, bicycles, agricultural equipment, construction equipment, etc.).	Iowa DOT Iowa DPS Advocates	4.3
Recommend a vulnerable road user law that increases penalties beyond the current penalties for a motorist that injures or kills a bicyclist, pedestrian, construction worker, law enforcement officer, or any other vulnerable roadway user.	Iowa DOT Iowa DPS Advocates	4.3
Continually revisit driver’s education curriculum to include the rights of bicyclists and pedestrians, as well as current and future vulnerable road user laws (subsequent to adoption of new laws).	Iowa DOT Iowa Bicycle Coalition	5.1, 5.3 4.3
Annually or biennially recalculate the On-Road Bicycle Compatibility Rating for all rural and metro area periphery paved roads in order to identify segments with poor conditions for biking. Coordinate gap elimination efforts with opportunities in upcoming projects.	Iowa DOT	3.5
Update this Bicycle and Pedestrian Long-Range Plan in 5 to 10 years.	Iowa DOT	2.2 – 2.4 3.5 4.4

⁵ See Chapter 3, Section 3.6

8.4 Long-term actions

Many of the direct and indirect recommendations of this plan can only be implemented by performing numerous implementation actions over the course of many years. Furthermore, some of the recommendations necessitate additional planning and analysis prior to implementation.

Below are examples of long-term implementation actions, which are not intended to be an exhaustive list of all future implementation needs. This plan will likely be updated before initiation begins for many of these actions, but it is important to consider future needs during current planning.

- Implement current plans for the US Bicycle Route and National Trails systems (which include the Mississippi River Trail, American Discovery Trail, and Lewis & Clark Trail). Revisit these plans every 5 to 10 years until each segment is completely implemented.
- Implement the Statewide Trails Vision plan discussed in Chapter 5 in an opportunity-based manner. This means constructing trails along the vision plan's alignment as right-of-way and funds become available. While the Iowa DOT has a role in providing funding for this purpose, implementation will primarily be the responsibility of cities, counties, MPOs/RPAs, the Department of Natural Resources, and nonprofit groups.

- Encourage every unit of government in Iowa that has jurisdiction of streets and roads to adopt a Complete Streets policy in order to accommodate bicyclists and pedestrians across the state.
- Continue to identify barriers and gaps in the state highway system for bicycling and walking that have not been corrected by reconstruction/3R activities and develop alternatives for providing adequate interim connections, especially in cities and metro areas.
- Continue to analyze crash data and develop strategies for increasing road safety for all users.
- Continue to expand education and encouragement programs to teach safe bicycling skills, educate road users on the rights and responsibilities of bicyclists and pedestrians, and encourage more people to ride and walk (since greater numbers of people biking has an inverse correlation with bicyclist crash rates).

Finally, it is important to update this Bicycle and Pedestrian Long-Range Plan at least every 10 years in order to account for infrastructure, legislative, and programmatic changes that affect bicycling and walking.



Technical support for implementation

To provide technical support to Iowa DOT staff implementing the Plan's recommendations and actions, technical content was developed concurrently. This content exists separate from this document and contains the following topics:

- Detailed review of federal, state, and regional plans and policies
- Design Manual review and recommendations
- Bridge Design Manual review and recommendations
- On-road bicycle compatibility rating methodology (see Chapter 4)
- Guidance on administering the absence of need tests outlined in the Complete Streets policy (see Chapter 6)

Measuring the effectiveness of actions and investments

Using data-driven methods to measure the success of Iowa's efforts to improve conditions for walking and bicycling is the most accurate way to determine the effectiveness of the various actions (including programs and policies) and infrastructure investments resulting from the Long-Range Plan. Suitable methods will include those that use quantifiable data to measure improvements in the bicycle and pedestrian systems that primarily result from changes to the programs, policies, and investments of the various agencies and organizations involved in implementing this plan (the Iowa DOT, cities, counties, regional agencies, advocates, the public health community, etc.).

8.5 Methods of measuring

There are two primary methods of measuring the effectiveness of efforts made to improve conditions for walking and bicycling—performance measures and input measures.

Performance measures are used to track the outcomes of broad infrastructure and programmatic actions on the part of all stakeholders. They are the primary way to determine the effectiveness of actions and investments. There are three basic performance measures:

- Usage – how many trips are made by foot or by bicycle each year?
- Safety – how many bicycle- and pedestrian-related crashes occur each year?
- Accessibility – how useable is the infrastructure that is in place (compatibility of streets and roads for bicyclists)?

In addition, public health statistics (e.g., including obesity rates, percentage of seniors getting sufficient physical activity, etc.) can be considered performance measures. However, while bicycling and walking are healthy activities that can positively affect these statistics, they are not the only relevant factors. Diet, genetics, socioeconomic, and other factors also have significant impacts.

Input measures track the actions taken by various stakeholders. They are the primary way in which to track the progress of actions and investments. Input measures are believed to have a positive impact on performance outcomes, but there is no guarantee until the relationships are established. Input measure categories include:

- Funding
- Education
- Facilities
- Policy



8.6 Performance measures (outcomes)

Performance measures should use quantifiable data to measure outcomes or trends that can be attributed as results of the programs, policies, and investments made by the Iowa DOT and others. In other words, they do not measure the actions—or inputs—of the Iowa DOT, such as how much funding is allocated, but instead they measure the results of those actions, such as how many more people are walking or biking.

Baseline data must be established for each performance measure, which in some cases will require the Iowa DOT and its partners to engage in new data collection activities. Once the baseline is established, a desired trend is identified for a specific point in the future for each performance measure. The Iowa DOT should consistently assess progress on each performance measure, preferably on an annual basis.

Pedestrian performance measures

The following performance measures will be used by the Iowa DOT to assess progress on improving conditions for walking in Iowa:

Usage – Pedestrian mode share		
<p>Baseline 3.5% (2015 ACS)</p>	<p>Data and method American Community Survey journey to work data is the most consistently-available source of mode share information. However, it a) is an estimate and b) factors only trips to work, ignoring walking trips made for other transportation purposes as well as recreational trips.</p>	<p>Strategies</p> <ul style="list-style-type: none"> • Expand sidewalk and multi-use trail networks in order to provide adequate access and connectivity for pedestrian needs. • Encourage more people to walk by providing safety materials, promote the health benefits of walking, increase the comfort and safety of infrastructure, and encourage communities to become walk-friendly. • Employers and communities can use incentives to promote walking.
<p>Desired trend Increase</p>	<p>It can be assumed, however, that journey to work trips account for 6 to 7% of all walking trips (the 2009 National Household Travel Survey reported that 6.7% of walking trips in Iowa were journey to work trips).</p>	
Safety – Pedestrian-related crashes per year		
<p>Baseline 467 (2008-2012 five-year average; includes all ages)</p>	<p>Data and method Pedestrian related crashes are recorded in the Iowa Crash Analysis Tool (ICAT) dataset maintained by the Iowa DOT.</p>	<p>Strategies</p> <ul style="list-style-type: none"> • Incorporate pedestrian safety into the state’s Strategic Highway Safety Plan. • Recommend legislation designed to protect all road users. • Conduct safety audits of intersections that have a high number of pedestrian crashes.
<p>Desired trend Decrease</p>		

Bicycle performance measures

The following performance measures will be used by the Iowa DOT to assess progress on improving conditions for bicycling in Iowa:

Usage – Bicycle mode share		
<p>Baseline 0.5% (2015 ACS)</p>	<p>Data and method American Community Survey journey to work data is the most consistently-available source of mode share information. However, it is an estimate and factors only trips to work, ignoring trips made for other transportation purposes as well as recreational trips.</p>	<p>Strategies</p> <ul style="list-style-type: none"> • Improve city streets and rural roads for bicycling by providing adequate accommodations based on traffic volumes, speeds, etc. • Encourage more people to bicycle by providing safety and how-to materials, on-the-bike training, continuing to popularize RAGBRAI, and encouraging communities and businesses to become bicycle-friendly.
<p>Desired trend Increase</p>	<p>It can be assumed, however, that journey to work trips account for 8 to 9% of all bicycling trips (the 2009 National Household Travel Survey reported that 8.1% of bicycling trips in Iowa were journey to work trips).</p>	
Safety – Bicycle-related crashes per year		
<p>Baseline 417 (2008-2012 five-year average; includes all ages)</p>	<p>Data and method Bicycle related crashes are recorded in the Iowa Crash Analysis Tool (ICAT) dataset maintained by the Iowa DOT.</p>	<p>Strategies</p> <ul style="list-style-type: none"> • Provide education for all road users on traffic law and bicyclists' rights. • Incorporate bike safety into the Strategic Highway Safety Plan. • Incorporate bicycle safety-related education into training for new and experienced law enforcement officials. • Recommend legislation designed to protect all road users.
<p>Desired trend Decrease</p>		
Accessibility – Percentage of the rural and urban transportation network suitable for bicycling		
<p>Baseline Rural: 64% rated "good" Urban: ___% rated LTS 1 or 2</p>	<p>Data and method Bicycle compatibility ratings for rural roads have been calculated as part of this Plan. The ratings should be recalculated annually or biennially as new traffic volume data is available and as infrastructure changes are made.</p>	<p>Strategies</p> <ul style="list-style-type: none"> • Provide training for planners and engineers (DOT, county, city) on how to effectively plan and design suitable accommodations. • Incorporate a review of bicycle compatibility/level of service ratings as part of each project and ensure that an improvement in suitability results from the project. • Consider the need to improve bicycle suitability as a criterion in the prioritization of 3R projects.
<p>Desired trend Increase</p>	<p>New data collection efforts on the part of the Iowa DOT, city, and county engineering departments will be needed to establish a baseline for bicycle Level of Traffic Stress (LTS; see Chapter 4, Section 4.13) and compile data on an annual basis.</p>	



Child performance measures

The following performance measures will be used by the Iowa DOT to assess progress on improving conditions for children that bicycle and walk in Iowa:

Safety – Bicycle- and pedestrian-related crashes involving children per year		
<p>Baseline 314 (2008-2012 five-year average)</p>	<p>Data and method Bicycle and pedestrian crashes are recorded in the Iowa Crash Analysis Tool (ICAT) dataset maintained by Iowa DOT.</p>	<p>Strategies</p> <ul style="list-style-type: none"> • Encourage each school district or individual school to complete a Safe Routes to School plan. • Provide education for all road users on traffic law and bicyclists' rights. • Incorporate bicycle and pedestrian safety into the Strategic Highway Safety Plan. • Incorporate bicycle safety-related education into training for new and experienced law enforcement officials. • Recommend legislation designed to protect all road users. • Conduct safety audits of intersections that have a high number of bicycle and/or pedestrian crashes. • Provide traffic safety education for school-aged children. • Provide adequate bicycle and pedestrian accommodations near schools.
<p>Desired trend Decrease</p>		

8.7 Input measures (actions)

Input measures are used to track the progress of the Iowa DOT and the state as a whole in implementing the Long-Range Plan and its various recommendations. On their own, input measures cannot be used to determine if implementation actions result in improved conditions for walking and bicycling; rather they can only be used to determine whether implementation is occurring at an adequate pace.

Input measure	Baseline	Desired trend	Related goal	Who measures or implements
Number of MPOs/RPAs, counties, and cities that have adopted a Complete Streets policy.	To be determined.	Increase	Valid, Coordinated, Connected, Funded, Well-Designed	Iowa DOT compiles data from MPOs and RPAs.
Annual percent of non-Interstate highway project centerline miles excepted by the Complete Streets policy.	n/a	Decrease	Valid, Coordinated, Connected, Funded, Well-Designed	Iowa DOT
Number of miles of paved shoulder (4+ feet wide excluding rumble strips) added to the primary highway system.	0 miles	Increase	Connected	Iowa DOT
Number of miles of bike lanes added to the system. (Data annually collected by each MPO/RPA).	0 miles	Increase	Connected	Iowa DOT compiles data from MPOs and RPAs.
Number of miles of sidewalks and curb ramps added to the system. (Data annually collected by each MPO/RPA).	0 miles	Increase	Connected	Iowa DOT compiles data from MPOs and RPAs.
Number of miles of multi-use trails added to the system. (Data annually collected by each MPO/RPA).	0 miles	Increase	Connected	Iowa DOT compiles data from MPOs and RPAs.
Percent of Iowa's Transportation Alternatives Program (TAP) funds (and any similar federal funding programs) used for bicycle and pedestrian purposes/projects.	To be determined.	Increase.	Funded	Iowa DOT compiles data from MPOs and RPAs.

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